

Appendix A

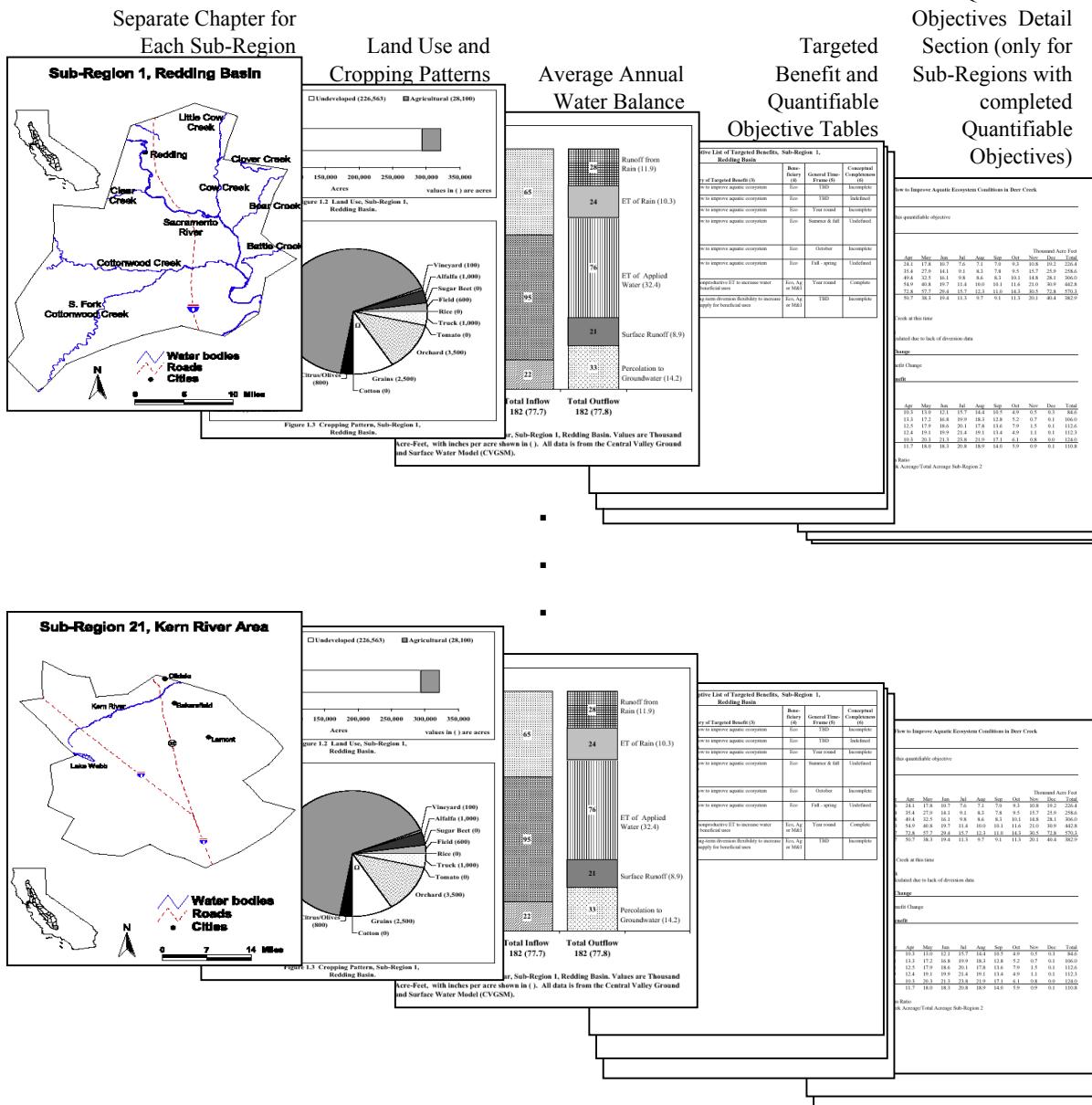
Complete List of Quantifiable Objectives by Sub-Region

Appendix A contains a list of the completed and potential Quantifiable Objectives (QOs). To-date, 196 potential QOs have been identified. Of these, approximately 50 have been completed. WUE proposals that incorporate completed QOs will be given extra weight in the selection process.

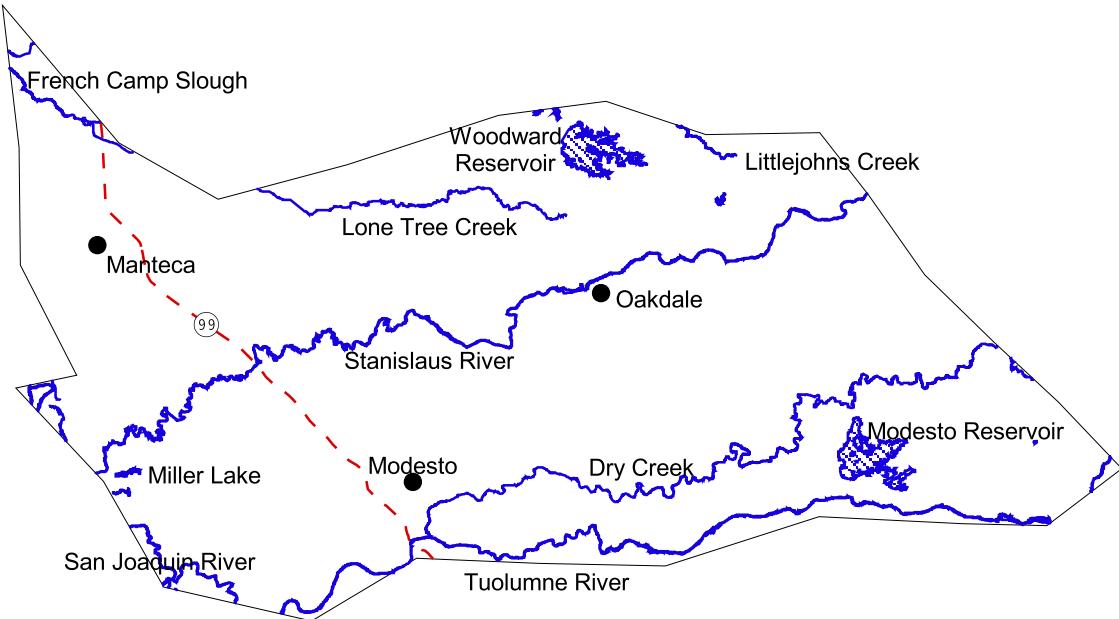
Readily available data does not exist to allow completion of the remaining QOs. However, approximately 45 of the uncompleted QOs have been identified as high priority, and proposals that are linked to these priority outcomes (or Targeted Benefits) will also receive extra weight in the selections (although not as much weight as those that incorporate completed QOs).

Appendix A is organized into 21 chapters that correspond to the 21 Sub-Regions defined in the QO analysis. Each chapter contains background information and details as illustrated in Figure A.I.

Figure A.I. Organization of Appendix A



Sub-Region 11, Eastern San Joaquin Valley above Tuolumne River

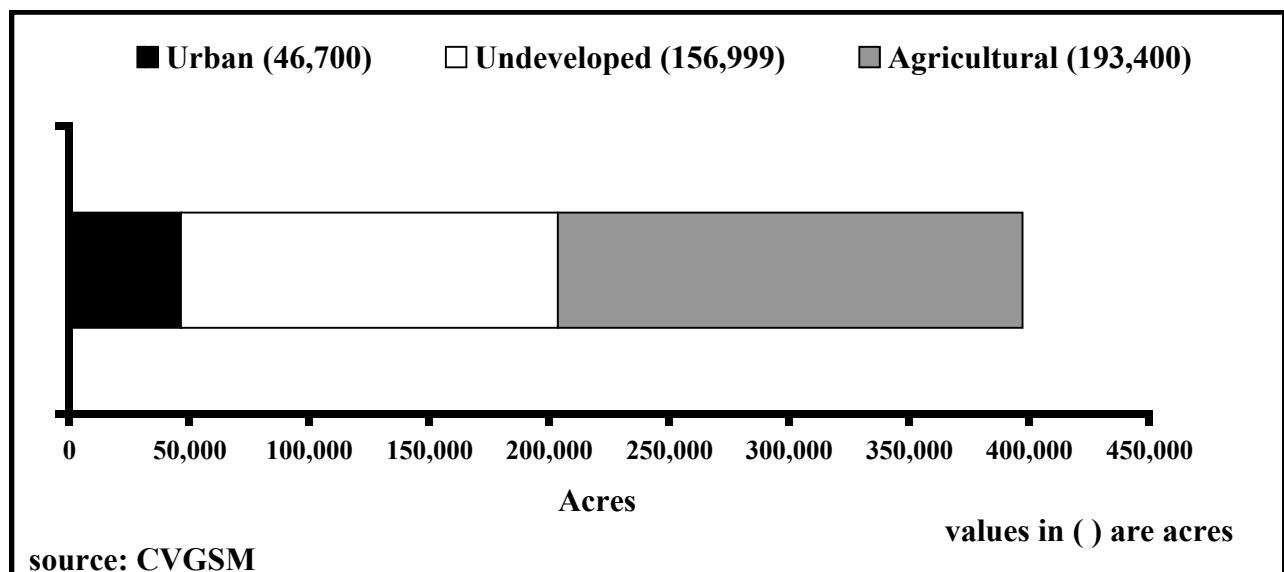


Water bodies
 Roads
 Cities

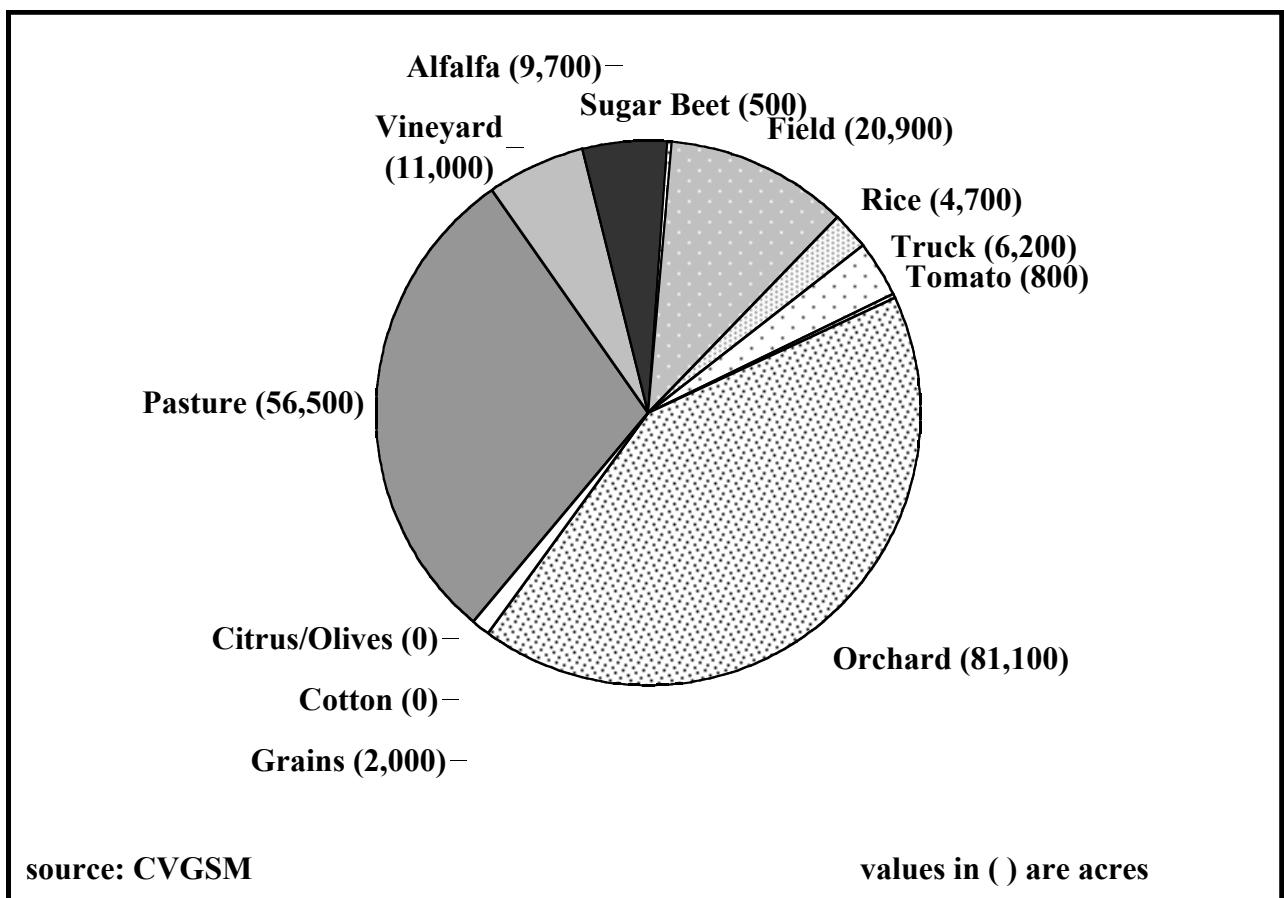


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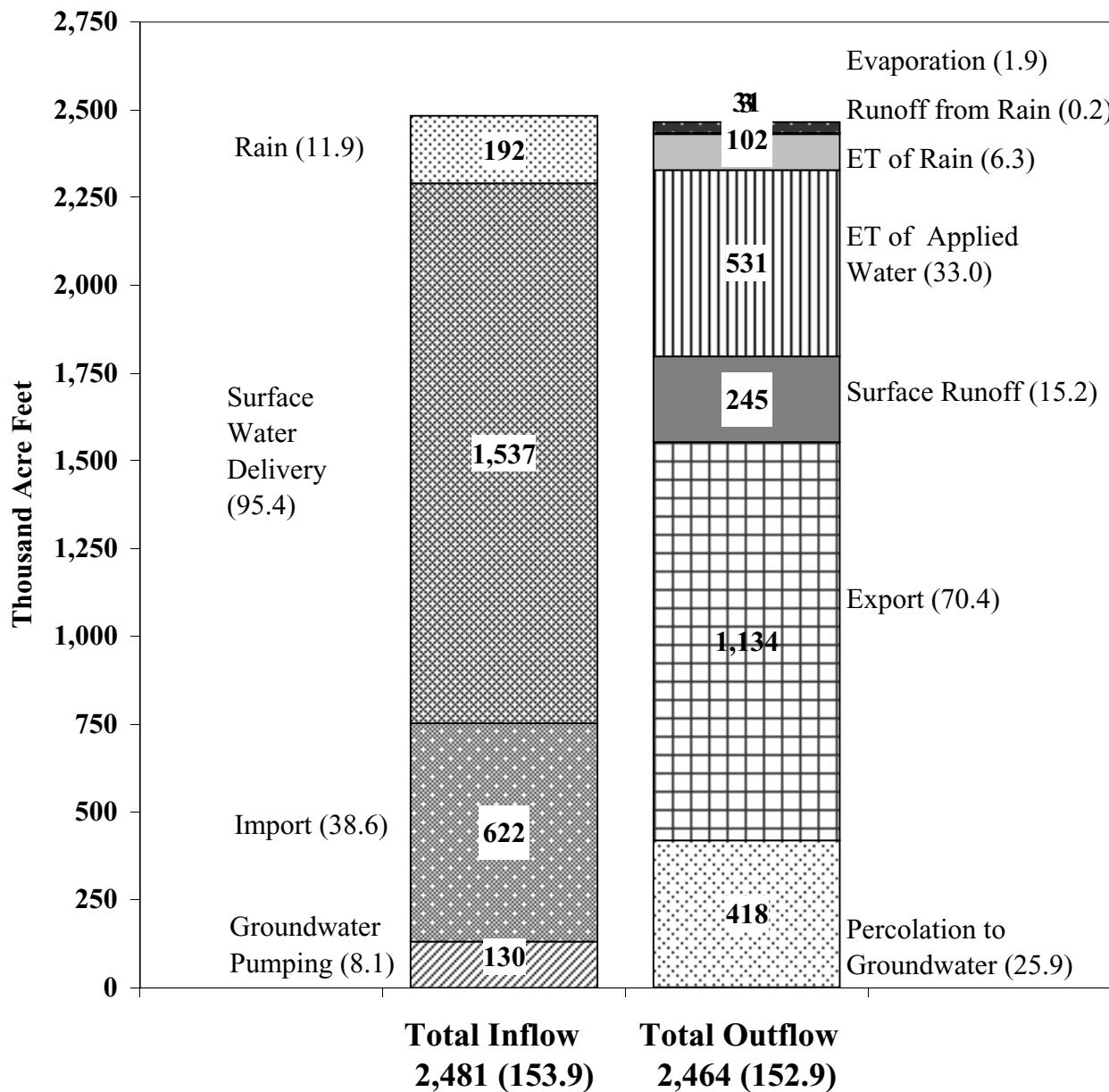
**Figure A.11.2 Land Use, Sub-Region 11,
Eastern San Joaquin Valley above Tuolumne River.**



**Figure A.11.3 Cropping Pattern, Sub-Region 11,
Eastern San Joaquin Valley above Tuolumne River.**



Sub-Region 11 Water Balance



Farm Water Balance, Average Year, Sub-Region 11, Eastern San Joaquin Valley above Tuolumne River. Values are Thousand Acre-Feet, with inches per acre shown in (). All data is from the Central Valley Ground and Surface Water Model (CVGSM).

**Table A.11.1. Descriptive List of Targeted Benefits, Sub-Region 11,
Eastern San Joaquin Valley above Tuolumne River**

TB # (1) [duplicate]	Location (2)	Category of Targeted Benefit (3)	Beneficiary (4)	General Time- Frame (5)	Conceptual Completeness (6)
112 [131, 148, 171]	San Joaquin River	Flow: Provide flow to improve aquatic ecosystem conditions	Eco	Fall	Incomplete
113	Stanislaus River	Flow: Provide flow to improve aquatic ecosystem conditions	Eco	Year round	Incomplete
114 [132]	Tuolumne River	Flow: Provide flow to improve aquatic ecosystem conditions	Eco	Fall - spring	Incomplete
115 [93, 134, 150]	San Joaq. Rr	Quality: Reduce group A pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
116	Stanislaus River	Quality: Reduce group A pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
117 [135]	Tuolumne River	Quality: Reduce group A pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
120 [82, 101, 137, 152]	San Joaquin River	Quality: Reduce pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
121	Stanislaus River	Quality: Reduce pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
122 [138]	Tuolumne River	Quality: Reduce pesticides to enhance and maintain beneficial uses of water	Eco or M&I	TBD	Complete
123 [104, 140, 154]	S. Joaq. Rr at Vernalis	Quality: Reduce salinity to enhance and maintain beneficial uses of water	Eco, Ag or M&I	TBD	Complete
124 [143, 157, 175]	San Joaq. Rr	Quality: Reduce temperatures to enhance and maintain aquatic species populations	Eco	TBD	Incomplete
125	Stanislaus River	Quality: Reduce temperatures to enhance and maintain aquatic species populations	Eco	Year round	Incomplete
126 [143]	Tuolumne River	Quality: Reduce temperatures to enhance and maintain aquatic species populations	Eco	Year round	Incomplete
127	All affected lands	Quantity: Decrease nonproductive ET to increase water supply for beneficial uses	Eco, Ag or M&I	Year round	Complete
128	All suitable lands	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Eco, Ag or M&I	TBD	Incomplete
129 [110, 146, 160]	Wetlands	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Eco	Variable	Incomplete

**Table A.11.2. Quantified Targeted Benefits, Sub-Region 11,
Eastern San Joaquin Valley above Tuolumne River**

TB # (1) [duplicate]	Source and Description of Quantified Targeted Benefit (7)
112 [131, 148, 171]	ERPP: Manage flow releases from tributary streams to provide adequate upstream and downstream passage of fall-run and late-fall-run chinook salmon, resident rainbow trout, and steelhead and spawning and rearing habitat for American shad, splittail, and sturgeon.
113	ERPP: Maintain specified flow regimes: for example, provide the base flows in the Stanislaus River below Goodwin Dam in critical, dry, and below-normal years, minimum flows should be 200 to 300 cfs, except for a flow event of 1,500 cfs for 30 days in April and May. Core: Provide the following flows and water depths for all life stages of chinook/steelhead fish: 10 day flow of 1500 cfs in October, water depth of approximately 2 feet in spawning reach from Oct. through May.
114 [132]	ERPP: Maintain specified flow releases: for example, in critical and below years 50 cfs Jun-Sept, 100 cfs Oct 1-15, 150 cfs from Oct- May plus 11,091 AF pulse flow. Core: Provide the following flows and water depths for all life stages of chinook/steelhead fish: 10 day flow of 1500 cfs in October, water depth of approximately 2 feet in spawning reach from Oct. through May.
115 [93, 134, 150]	303(d): Reduce [Group A pesticide] and DDT to ____.
116	303(d): Reduce _____ [Group A pesticide] to ____.
117 [135]	303(d): Reduce _____ [Group A pesticide] to ____.
120 [82, 101, 137, 152]	303(d): Reduce chlorpyrifos and diazinon to ____.
121	303(d): Reduce diazinon to <0.04 ug L ⁻¹
122 [138]	303(d): Reduce diazinon to <0.04 ug L ⁻¹
123 [104, 140, 154]	Core: Reduce salinity levels at 0.7 dS/m April 1 - August 1, 1.0 dS/m September 1 - March 31 at Vernalis. 303d: Reduce salinity to ____.
124 [143, 157, 175]	ERPP: Manage reservoir releases and other factors to provide suitable water temperatures for key resources from the Merced River confluence to Vernalis
125	ERPP: Provide suitable water temperatures for salmon spawning area during the fall and winter and to the mouth of the river during the spring as follows: Oct 15 to Feb 15 - 56F and Apr 1 to May 31 - 65F. Core: Provide temperatures for all life stages of chinook/steelhead: Rearing habitat, < 58°F year round; spawning reach, < 53°F in Sept. and < 50°F Oct.-May; migration corridor, < 65°F Jan.-June.
126 [143]	ERPP: Provide suitable water temperatures for salmon spawning area during the fall and winter and to the mouth of the river during the spring as follows: Oct 15 to Feb 15 - 56F and Apr 1 to May 31 - 65F. Core: Provide temperatures for all life stages of chinook/steelhead: Rearing habitat, < 58°F year round; spawning reach, < 53°F in Sept. and < 50°F Oct.-May; migration corridor, < 65°F Jan.-June.
127	Core: Reduce unwanted ET by 7,500 acre-feet per year.
128	Core: Enhance the effectiveness of potential conjunctive use programs by reducing flows to groundwater to _____ acre feet per year during periods of shortage; and increasing flows to groundwater to _____ acre feet per year during periods of excess.
129 [110, 146, 160]	ERPP/ Cooperatively manage _____ acres of ag lands and restore _____ acres of seasonal, semipermanent, and Core: permanent wetlands consistent with the CV Habitat Jt Venture and N. Am. Waterfowl Mgmt. Plan.

**Table A.11.3. Quantified Targeted Benefit Change, Sub-Region 11,
Eastern San Joaquin Valley above Tuolumne River**

TB # (1) [duplicate]	Reference Condition		Benefit		Quantified Targeted Benefit Change			Specific Time- Frame (11)
	Data Source (8)	Data Availability (9)	Data Source (8)	Data Availability (9)	Data Source (8)	Data Availability (9)	Range of Values (10)	
112 [131, 148, 171]	CVGSM	Unproven- precise	ERPP	Not available	Not available	Non-existant	Not available	Varies
113	CVGSM	Unproven- precise	ERPP	Rough estimate	Calculated	Rough estimate	31.1 - 170.6 TAF/yr	Year round
114 [132]	CVGSM	Unproven- precise	ERPP	Rough estimate	Calculated	Rough estimate	13 - 43.3 TAF/yr	Varies
115 [93, 134, 150]	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
116	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
117 [135]	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
120 [82, 101, 137, 152]	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
121	USGS Circ. 1159	Proven - precise	US EPA	Proven - precise	Calculated	Proven - precise (limited)	0-0.046 ug L ⁻¹	Jan-Feb
122 [138]	TBD	TBD	TBD	Proven - precise	Calculated	TBD	TBD	TBD
123 [104, 140, 154]	RWQCB	Proven - precise	RWQCB	Proven - precise	Calculated	Proven - precise	TBD	Year round
124 [143, 157, 1751]	TBD	TBD	ERPP	Not available	Not available	Not available	Not available	Not available
125	TBD	TBD	ERPP	Unproven - precise	Calculated	TBD	TBD	Year round
126 [143]	TBD	TBD	ERPP	Unproven - precise	Calculated	TBD	TBD	Year round
127	CVGSM	Unproven- precise	Core	Rough estimate	Calculated	Rough estimate	7.5 TAF/yr	TBD
128	CVGSM	Unproven- precise	Core	Rough estimate	Calculated	Rough estimate	TBD	TBD
129 [110, 146, 160]	CVHJVIP	Insufficient	CVHJVIP	Uproven - precise	Not available	Insufficient	Not available	Not available

**Table A.11.4. Quantifiable Objective, Sub-Region 11,
Eastern San Joaquin Valley above Tuolumne River**

TB # (1) [duplicate]	Achievable Agricultural Potential (12)	Quantifiable Objective (13)
112 [131, 148, 171]	TBD	TBD
113	147.2 - 256.2 TAF per year	14 - 129.1 TAF per year
114 [132]	205.5 - 321.3 TAF per year	13 - 43.3 TAF per year
115 [93, 134, 150]	TBD	TBD
116	TBD	TBD
117 [135]	TBD	TBD
120 [82, 101, 137, 152]	TBD	TBD
121	TBD	TBD
122 [138]	TBD	TBD
123 [104, 140, 154]	TBD	TBD
124 [143, 157, 175]	TBD	TBD
125	TBD	TBD
126 [143]	TBD	TBD
127	7.5 TAF/Yr plus additional water generated through reduction in application through improved irrigation systems	7.5 TAF/Yr plus additional water generated through reduction in application through improved irrigation systems
128	TBD	TBD
129 [110, 146, 160]	TBD	TBD

**Table A.11.5. Affected Flow Paths and Possible Actions, Sub-Region 11,
Eastern San Joaquin Valley above Tuolumne River**

TB # (1) [duplicate]	Affected Flow Paths (14)	Possible Actions (provided as examples; proposers are encouraged to consider local actions that are not listed) (15)
112 [131, 148, 171]	TBD	TBD
113	Surface and Groundwater Return	Improve farm irrigation management (such as irrigation scheduling) and more uniform irrigation methods (such as shorter furrows, sprinkler, or drip). Reduction in operational spill through improved management, canal automation or regulatory storage. Reduction in canal seepage through canal lining or piping.
114 [132]	Surface and Groundwater Return	Improve farm irrigation management (such as irrigation scheduling) and more uniform irrigation methods (such as shorter furrows, sprinkler, or drip). Reduction in operational spill through improved management, canal automation or regulatory storage. Reduction in canal seepage through canal lining or piping.
115 [93, 134, 150]	TBD	TBD
116	TBD	TBD
117 [135]	TBD	TBD
120 [82, 101, 137, 152]	Surface and Groundwater Return	cover crop, furrow or field diking and reduction in late season irrigation. Note: significant contributions to this TB can also be made through changes in chemical applications that are outside the scope of AgWUE.
121	Surface and Groundwater Return	cover crop, furrow or field diking and reduction in late season irrigation. Note: significant contributions to this TB can also be made through changes in chemical applications that are outside the scope of AgWUE.
122 [138]	TBD	TBD
123 [104, 140, 154]	TBD	TBD
124 [143, 157, 175]	TBD	TBD
125	TBD	TBD
126 [143]	TBD	TBD
127	ETAW	Reduce ET flows using improved irrigation methods, such as drip irrigation, and planting densities.
128	TBD	TBD
129 [110, 146, 160]	TBD	TBD

Detail 113, Flow/Timing Stanislaus River

Step 1. Quantified Targets

A. Fish Flow Targets for the Stanislaus River (from upper reach to San Joaquin River)

source: CALFED Ecosystem Restoration Program Plan

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	15.3	13.9	15.3	53.8	53.8	11.9	12.3	12.3	11.9	12.3	14.9	15.3	242.8
2) Dry	16.9	15.2	16.9	53.8	53.8	11.9	12.3	12.3	11.9	15.3	16.3	16.9	253.4
3) B Norm	18.4	16.6	18.4	71.6	71.6	14.9	15.3	15.3	14.9	15.3	17.8	18.4	308.6
4) A Norm	21.5	19.4	21.5	89.1	92.1	47.5	18.4	18.4	17.8	21.5	20.8	21.5	409.5
5) Wet	24.6	22.2	24.6	89.1	92.1	89.1	18.4	18.4	17.8	21.5	23.8	24.6	466.0
Wtd Avg.	18.9	17.1	18.9	69.9	71.0	32.4	15.1	15.1	14.6	16.9	18.3	18.9	327.3

B. Additional Flow Requirements to Meet Water Quality Permit at Vernalis on the S. Joaquin R. (TB# 123)

source: Planning Unit

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	6.0	1.0	39.0	30.0	20.0	0.0	4.0	0.0	0.0	100.0
2) Dry	0.0	1.0	1.0	6.0	0.0	34.0	38.0	28.0	0.0	2.0	0.0	0.0	110.0
3) B Norm	0.0	0.0	0.0	3.0	0.0	28.0	41.0	38.0	1.0	1.0	0.0	0.0	112.0
4) A Norm	0.0	0.0	0.0	0.0	0.0	0.0	22.0	24.0	0.0	0.0	0.0	0.0	46.0
5) Wet	0.0	0.0	0.0	0.0	0.0	0.0	8.0	19.0	0.0	1.0	0.0	0.0	28.0
Wtd Avg.	0.0	0.2	0.2	3.3	0.3	21.5	28.1	25.2	0.2	1.8	0.0	0.0	80.7

C. Combined Flow Requirements for Fish and Water Quality

source: Step 1A. + Step 1B.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	15.3	13.9	15.3	59.8	54.8	50.9	42.3	32.3	11.9	16.3	14.9	15.3	342.8
2) Dry	16.9	16.2	17.9	59.8	53.8	45.9	50.3	40.3	11.9	17.3	16.3	16.9	363.4
3) B Norm	18.4	16.6	18.4	74.6	71.6	42.9	56.3	53.3	15.9	16.3	17.8	18.4	420.6
4) A Norm	21.5	19.4	21.5	89.1	92.1	47.5	40.4	42.4	17.8	21.5	20.8	21.5	455.5
5) Wet	24.6	22.2	24.6	89.1	92.1	89.1	26.4	37.4	17.8	22.5	23.8	24.6	494.0
Wtd Avg.	18.9	17.3	19.2	73.2	71.3	53.9	43.2	40.3	14.8	18.6	18.3	18.9	408.0

Step 2. Reference Condition

A. Stanislaus River Flows

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	20.4	21.2	43.7	82.3	91.3	87.6	72.7	61.6	38.9	22.7	12.5	18.5	573.3
2) Dry	29.6	31.2	60.3	137.3	186.3	119.5	82.5	69.4	36.2	25.2	17.9	25.4	820.8
3) B Norm	50.0	74.8	88.5	168.4	260.0	182.4	86.3	74.3	49.0	19.0	13.8	27.9	1094.4
4) A Norm	97.2	94.3	129.0	176.8	276.3	191.5	95.0	76.8	52.1	28.1	37.5	88.7	1343.4
5) Wet	98.2	104.4	152.2	222.5	361.5	274.9	150.5	122.8	85.7	25.7	15.1	53.5	1666.8
Wtd Avg.	56.1	60.9	90.0	150.1	220.8	161.6	94.1	78.2	50.3	24.3	19.7	42.2	1048.3

B. Stanislaus River Diversions - Oakdale & S. San Joaquin

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	6.1	9.2	22.3	59.6	66.2	63.4	64.0	54.6	33.5	11.1	1.9	1.9	393.8
2) Dry	9.5	6.2	18.2	63.9	85.3	79.8	73.7	61.8	33.4	18.3	1.9	1.1	453.1
3) B Norm	3.5	9.6	18.6	53.7	80.1	85.0	82.1	74.0	49.0	15.6	2.3	0.9	474.4
4) A Norm	1.7	8.0	18.5	52.1	87.1	88.9	85.7	73.8	49.4	19.0	4.2	1.3	489.7
5) Wet	4.1	3.2	13.4	47.0	84.4	92.9	95.1	93.6	63.3	14.6	2.9	3.5	518.0
Wtd Avg.	5.1	7.4	18.6	55.9	79.7	80.4	78.5	69.5	44.2	15.6	2.6	1.7	459.3

C. Reference Condition for Stanislaus River

source: calculated = Step 2A. - Step 2B.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	14.4	12.0	21.4	22.6	25.1	24.1	8.7	6.9	5.4	11.6	10.6	16.6	179.5
2) Dry	20.2	25.0	42.1	73.4	101.0	39.7	8.8	7.6	2.8	6.9	16.0	24.3	367.7
3) B Norm	46.5	65.2	70.0	114.6	179.9	97.4	4.2	0.3	0.0	3.4	11.5	27.0	619.9
4) A Norm	95.5	86.2	110.5	124.7	189.2	102.6	9.3	3.0	2.7	9.1	33.3	87.5	853.7
5) Wet	94.1	101.2	138.8	175.5	277.0	182.0	55.3	29.3	22.4	11.1	12.2	49.9	1148.8
Wtd Avg.	51.0	53.5	71.4	94.2	141.0	81.2	15.6	8.7	6.1	8.7	17.0	40.5	589.0

Step 3. Quantified Targeted Benefit Change

A. Quantified Targeted Benefit Change

source: calculated: = Step 1C. - Step 2C.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	1.0	1.9	0.0	37.1	29.6	26.8	33.5	25.4	6.5	4.7	4.3	0.0	170.6
2) Dry	0.0	0.0	0.0	0.0	0.0	6.2	41.5	32.7	9.1	10.5	0.3	0.0	100.2
3) B Norm	0.0	0.0	0.0	0.0	0.0	0.0	52.2	53.0	15.9	13.0	6.3	0.0	140.3
4) A Norm	0.0	0.0	0.0	0.0	0.0	0.0	31.1	39.4	15.1	12.4	0.0	0.0	98.1
5) Wet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	11.4	11.5	0.0	31.1
Wtd Avg.	0.3	0.5	0.0	9.7	7.7	8.2	32.2	31.6	9.3	9.9	4.0	0.0	113.5

Step 4. Area Affected By Targeted Benefit

A. Total Diversion Sub-Region 11

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	10.9	15.1	55.5	119.2	127.9	138.2	147.6	127.4	73.4	34.5	8.7	8.2	866.4
2) Dry	12.5	10.3	47.6	137.8	170.4	165.8	162.0	140.2	81.5	44.4	8.1	5.9	986.5
3) B Norm	7.6	12.4	46.4	112.7	162.2	176.5	174.1	154.5	102.8	37.1	8.5	4.5	999.3
4) A Norm	2.7	14.2	42.6	106.8	171.5	182.0	177.9	155.2	104.0	45.0	12.4	5.9	1020.1
5) Wet	5.7	3.9	25.6	93.1	163.6	186.9	194.5	176.8	124.1	38.4	16.2	13.5	1042.2
Wtd Avg.	8.1	11.7	44.9	115.1	157.2	167.2	168.8	148.2	94.5	39.8	10.5	7.5	973.4

B. Sub-Region 11 Streamflow Diversion Ratio

source: calculated = Step 2B./Step 4A.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1) Critical	0.56	0.61	0.40	0.50	0.52	0.46	0.43	0.43	0.46	0.32	0.22	0.23
2) Dry	0.76	0.60	0.38	0.46	0.50	0.48	0.45	0.44	0.41	0.41	0.23	0.18
3) B Norm	0.47	0.78	0.40	0.48	0.49	0.48	0.47	0.48	0.48	0.42	0.27	0.20
4) A Norm	0.61	0.56	0.43	0.49	0.51	0.49	0.48	0.48	0.48	0.42	0.34	0.21
5) Wet	0.72	0.81	0.52	0.50	0.52	0.50	0.49	0.53	0.51	0.38	0.18	0.26
Wtd Avg.	0.62	0.66	0.42	0.49	0.51	0.48	0.46	0.47	0.46	0.39	0.25	0.22

Step 5. Water Balance - Flow Path Elements

A. Rain Sub-Region (inflow)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	15.6	12.4	6.6	5.9	3.4	1.0	0.0	0.4	1.1	2.1	3.2	4.9	56.6
2) Dry	19.1	15.3	11.4	5.4	3.7	0.4	0.1	0.2	1.9	4.7	4.3	4.1	70.4
3) B Norm	16.6	28.7	10.5	9.3	3.3	0.4	0.0	0.1	0.3	3.4	8.4	6.5	87.5
4) A Norm	21.9	20.7	15.6	9.6	1.4	0.5	0.5	0.7	0.9	5.8	9.0	9.3	95.8
5) Wet	39.4	36.8	24.1	17.7	2.7	0.6	0.6	0.2	3.7	5.1	5.2	12.9	149.2
Wtd Avg.	21.6	21.3	13.0	9.0	2.9	0.6	0.2	0.3	1.5	4.1	5.8	7.2	87.6

B. Surface Water Diversions Sub-Region (inflow)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	3.7	4.5	20.6	81.1	97.3	98.3	96.4	90.2	61.8	15.5	8.7	6.9	584.9
2) Dry	6.2	11.9	20.6	90.8	105.8	118.2	119.0	111.9	66.5	20.9	11.4	4.5	687.6
3) B Norm	3.6	13.2	31.3	94.3	113.6	124.1	123.9	126.1	82.1	21.0	12.4	5.5	751.2
4) A Norm	6.2	8.9	33.2	101.5	118.7	128.6	128.9	123.9	84.0	22.1	16.8	7.9	780.9
5) Wet	12.1	9.6	38.6	106.4	122.7	131.2	137.6	137.4	89.2	19.8	7.8	11.6	824.2
Wtd Avg.	6.1	9.2	27.9	93.6	110.3	118.3	119.0	115.2	75.2	19.6	11.5	7.2	713.0

C. Import Sub-Region (inflow)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	1.1	1.3	7.8	33.0	40.9	39.3	39.1	36.4	26.4	8.1	2.9	2.3	238.8
2) Dry	1.8	1.6	8.9	36.2	46.8	48.2	48.7	44.9	27.9	11.0	3.5	2.1	281.7
3) B Norm	1.0	2.0	10.3	39.3	48.4	50.3	52.9	50.8	33.9	10.9	3.8	2.1	305.6
4) A Norm	1.5	1.5	11.3	40.5	50.1	51.4	54.3	50.5	34.0	11.4	5.2	2.6	314.4
5) Wet	1.8	2.0	13.6	41.9	50.8	52.3	55.1	56.1	36.5	10.3	2.6	3.1	326.0
Wtd Avg.	1.4	1.6	10.1	37.7	46.9	47.6	49.1	46.6	31.2	10.2	3.6	2.4	288.5

D. Groundwater Pumping Sub-Region (inflow)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	1.9	2.0	9.9	8.7	9.3	11.2	10.8	5.2	4.2	3.0	1.0	1.0	68.1
2) Dry	2.7	2.2	3.2	4.5	5.7	11.6	11.0	5.2	3.8	3.3	1.1	0.8	55.1
3) B Norm	1.6	2.8	3.3	4.3	5.6	11.7	11.4	5.7	4.4	3.3	1.2	0.8	56.3
4) A Norm	2.3	2.0	2.5	4.4	5.8	11.8	11.7	5.6	4.4	3.3	1.5	0.9	56.4
5) Wet	2.9	2.8	3.0	4.6	5.9	12.0	11.9	6.3	4.7	2.8	0.8	1.2	58.8
Wtd Avg.	2.3	2.3	4.8	5.6	6.7	11.6	11.3	5.5	4.3	3.2	1.1	0.9	59.6

E. ET Rain Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	6.0	8.0	4.8	5.0	4.5	3.0	3.1	1.2	0.5	2.4	1.7	1.3	41.3
2) Dry	7.9	7.9	8.1	4.9	4.1	1.7	1.5	0.1	0.8	4.0	1.7	1.4	44.0
3) B Norm	5.1	10.7	7.4	7.8	3.6	1.6	1.5	0.1	-0.2	3.7	2.5	1.4	45.2
4) A Norm	6.6	7.7	9.4	8.0	1.9	1.3	1.9	0.6	0.3	4.9	3.8	1.6	47.9
5) Wet	8.1	11.3	11.5	13.5	3.1	1.7	2.1	0.2	2.5	4.5	2.1	2.1	62.7
Wtd Avg.	6.7	8.9	8.0	7.4	3.5	1.9	2.1	0.5	0.7	3.8	2.3	1.5	47.3

F. Runoff from Rain Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
2) Dry	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7
3) B Norm	0.5	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	1.6
4) A Norm	0.5	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.7
5) Wet	1.6	1.7	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	5.3
Wtd Avg.	0.5	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.7

G. ETAW Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.3	0.9	7.5	20.8	38.9	45.1	47.2	40.3	29.0	9.5	1.5	0.6	241.5
2) Dry	0.6	0.8	3.6	19.1	37.9	48.8	51.3	42.6	25.6	11.3	1.7	0.0	243.2
3) B Norm	0.1	0.6	4.9	16.8	37.8	48.9	53.2	46.2	30.9	11.9	1.5	0.2	252.9
4) A Norm	0.3	0.5	3.9	17.1	40.7	49.9	54.0	45.4	30.4	10.8	1.1	0.1	254.2
5) Wet	0.0	0.5	4.4	12.5	40.1	50.3	54.7	51.0	30.4	9.7	0.4	0.0	254.1
Wtd Avg.	0.3	0.7	5.0	17.7	39.1	48.3	51.7	44.5	29.2	10.5	1.3	0.2	248.4

H. Export Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	4.2	4.9	15.7	58.3	69.7	70.1	68.8	64.3	43.5	11.3	7.8	6.3	424.9
2) Dry	6.8	11.3	15.7	66.0	76.1	84.7	85.7	80.9	47.4	15.4	10.1	4.1	504.1
3) B Norm	4.0	12.9	24.6	68.6	82.6	89.5	89.3	91.6	59.0	15.4	11.0	5.0	553.6
4) A Norm	6.6	8.8	26.1	74.3	86.5	93.1	93.1	89.9	60.5	16.3	14.8	7.1	577.1
5) Wet	11.9	9.8	30.3	78.1	89.7	95.1	100.2	99.7	64.2	14.7	6.9	10.3	610.8
Wtd Avg.	6.5	9.1	21.7	68.2	79.9	85.1	85.8	83.2	53.8	14.4	10.1	6.5	524.2

I. Surface Water Return Sub-Region (outflow, recoverable)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.4	0.4	4.4	13.5	16.2	16.5	16.1	14.3	10.3	3.1	1.2	0.9	97.4
2) Dry	0.6	1.0	3.5	14.1	17.2	19.6	19.5	17.2	10.8	4.2	1.6	0.7	110.0
3) B Norm	0.4	1.2	4.5	14.8	18.0	20.1	20.6	19.4	13.0	4.1	1.7	0.8	118.5
4) A Norm	0.6	0.8	4.6	15.5	18.7	20.6	21.2	19.1	13.1	4.4	2.4	1.0	122.0
5) Wet	1.1	0.9	5.5	16.1	19.2	21.0	22.0	21.3	14.0	3.8	1.1	1.4	127.3
Wtd Avg.	0.6	0.8	4.5	14.7	17.7	19.3	19.6	17.8	12.1	3.9	1.6	0.9	113.4

J. Percolation to groundwater Sub-Region (outflow, recoverable)

source: CVGSM Sub-Region 11 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	10.8	6.4	11.4	28.5	19.5	14.2	11.1	10.0	7.7	2.4	2.9	5.0	130.0
2) Dry	13.4	9.1	12.1	30.0	23.9	21.3	18.5	17.4	12.7	4.6	4.2	4.5	171.7
3) B Norm	12.3	21.3	12.5	36.2	25.5	23.5	21.0	21.0	14.8	3.4	7.7	6.9	205.9
4) A Norm	16.7	14.4	17.0	37.7	24.7	24.2	22.3	21.3	15.7	5.6	9.8	9.9	219.3
5) Wet	32.5	27.4	25.2	46.2	26.5	24.7	23.1	23.1	19.1	4.9	5.4	13.9	272.0
Wtd Avg.	16.3	14.4	15.2	34.9	23.6	21.0	18.5	17.8	13.4	4.1	5.8	7.7	192.6

K. Evaporation Flows Sub-Region (outflow, irrecoverable)

source: = 0.02 * (Step 5B + 5C - 5H)

= 0.02 * (Surface Water Diversion + Import - Export)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.3	1.1	1.4	1.4	1.3	1.2	0.9	0.2	0.1	0.1	8.0
2) Dry	0.0	0.0	0.3	1.2	1.5	1.6	1.6	1.5	0.9	0.3	0.1	0.0	9.3
3) B Norm	0.0	0.0	0.3	1.3	1.6	1.7	1.7	1.7	1.1	0.3	0.1	0.1	10.1
4) A Norm	0.0	0.0	0.4	1.4	1.6	1.7	1.8	1.7	1.1	0.3	0.1	0.1	10.4
5) Wet	0.0	0.0	0.4	1.4	1.7	1.8	1.9	1.9	1.2	0.3	0.1	0.1	10.8
Wtd Avg.	0.0	0.0	0.3	1.3	1.5	1.6	1.6	1.6	1.1	0.3	0.1	0.1	9.5

L. Sub-Region Water Balance

source: = Step 5.(A + B + C + D) - Step5. (E + F + G + H + I + J + K)

= (Rain + Surface Water Diversions + Import + Groundwater Pumping) - (ET Rain +

Runoff from Rain + ETAW + Export + Surface & Groundwater Return + Evaporation)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.5	-0.5	0.9	1.4	0.7	-0.4	-1.4	0.9	1.7	-0.3	0.7	0.9	5.0
2) Dry	0.1	0.4	0.7	1.8	1.4	0.8	0.7	2.5	1.8	0.0	0.9	0.6	11.8
3) B Norm	0.4	-0.6	1.2	1.7	1.8	1.2	0.8	2.8	2.1	-0.3	1.3	0.5	12.9
4) A Norm	0.6	0.5	0.9	2.1	1.8	1.7	1.1	2.8	2.2	0.2	0.5	0.7	15.1
5) Wet	0.9	-0.3	0.9	2.3	1.9	1.6	1.3	2.8	2.6	0.2	0.4	0.6	15.2
Wtd Avg.	0.5	-0.1	0.9	1.8	1.4	0.9	0.3	2.2	2.1	0.0	0.7	0.7	11.5

M. Applied Water Ratio Sub-Region

source: = Step 5G / Step 5 (B + C+ D - H)

= ETAW/(Surfce Water Diversions + Import + Groundwater Pumping - Export)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.12	0.30	0.33	0.32	0.50	0.57	0.61	0.60	0.59	0.62	0.32	0.14	0.52
2) Dry	0.16	0.17	0.21	0.29	0.46	0.52	0.55	0.52	0.50	0.57	0.29	0.01	0.47
3) B Norm	0.06	0.11	0.24	0.24	0.44	0.51	0.54	0.51	0.50	0.60	0.23	0.06	0.45
4) A Norm	0.10	0.13	0.18	0.24	0.46	0.50	0.53	0.50	0.49	0.53	0.12	0.02	0.44
5) Wet	0.00	0.10	0.18	0.17	0.45	0.50	0.52	0.51	0.46	0.53	0.10	0.00	0.42
Wtd Avg.	0.1	0.2	0.2	0.3	0.5	0.5	0.6	0.5	0.5	0.6	0.2	0.1	0.5

N. Groundwater Check Sub-Region

source: = Step 5 (J - D)

= Groundwater Return Flows - Groundwater Pumping

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	8.9	4.4	1.5	19.8	10.2	3.0	0.3	4.8	3.5	-0.6	1.9	4.0	61.9
2) Dry	10.6	6.9	8.9	25.5	18.2	9.7	7.5	12.2	8.9	1.3	3.2	3.8	116.6
3) B Norm	10.7	18.5	9.2	31.9	19.9	11.8	9.6	15.3	10.4	0.1	6.4	6.0	149.6
4) A Norm	14.5	12.3	14.5	33.3	19.0	12.3	10.6	15.6	11.2	2.3	8.2	9.0	162.9
5) Wet	29.6	24.6	22.2	41.6	20.6	12.7	11.2	16.9	14.3	2.1	4.6	12.7	213.2
Wtd Avg.	14.1	12.1	10.4	29.3	16.9	9.3	7.2	12.3	9.1	0.9	4.7	6.8	133.0

Step 6. Idealized Agricultural Potential

A. Export Adjustment

0% of Export (Step 5H.) water is available for flow/timing changes in Sub-Region 11

note: Import (Step 5C) and Export (Step 5H) are in the water balance. In this Step (7D) Export water is considered water that flows through districts in Sub-Regions 4, 5, and 7. This water is available to make flow/timing changes

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
2) Dry	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
3) B Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
4) A Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
5) Wet	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
Wtd Avg.	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0

B. Idealized Agricultural Potential

source: = Step 5 ((B + C + D) + Step 6A. - Step 5 (G + H))

= Surface Water Diversions + Import + Groundwater Diversions) - (ETAW + Export
+ Export Adjustment)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	15.2	43.7	38.8	33.7	30.2	27.2	20.0	5.7	---	---	214.4
2) Dry	---	---	13.4	46.5	44.4	44.6	41.7	38.5	25.2	8.5	---	---	262.9
3) B Norm	---	---	15.4	52.5	47.2	47.6	45.7	44.7	30.6	7.8	---	---	291.6
4) A Norm	---	---	17.1	55.0	47.3	49.0	47.8	44.7	31.5	9.7	---	---	302.1
5) Wet	---	---	20.5	62.3	49.6	50.2	49.7	49.1	35.7	8.6	---	---	325.8
Wtd Avg.	---	---	16.1	51.1	44.9	44.1	41.9	39.6	27.7	8.0	---	---	273.4

Step 7. Achievable Agricultural Potential

A. Farm Demand

assumes farm loss fraction of 0.13 for Sub-Region 11, values vary by SubRegion

source: = ETAW / Farm High (1- loss fraction)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	8.6	23.9	44.7	51.8	54.3	46.3	33.3	10.9	---	---	273.9
2) Dry	---	---	4.1	21.9	43.5	56.1	59.0	48.9	29.5	13.0	---	---	275.9
3) B Norm	---	---	5.6	19.3	43.4	56.2	61.2	53.1	35.6	13.7	---	---	288.0
4) A Norm	---	---	4.4	19.7	46.8	57.3	62.1	52.2	34.9	12.4	---	---	289.8
5) Wet	---	---	5.1	14.4	46.1	57.8	62.9	58.6	35.0	11.1	---	---	291.0
Wtd Avg.	---	---	5.8	20.3	44.9	55.5	59.4	51.2	33.5	12.1	---	---	282.7

B. Groundwater Pumping after System Improvements

Existing Farm Efficiency for Sub-Region 11 = 0.7

source: = $(1 - 0.7 * (1/0.7 - 1/(1 - \text{Farm Loss Fraction}))) * \text{Groundwater Pumping}$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	8.0	7.0	7.5	9.1	8.7	4.2	3.4	2.4	---	---	50.1
2) Dry	---	---	2.6	3.6	4.6	9.4	8.9	4.2	3.0	2.7	---	---	38.9
3) B Norm	---	---	2.7	3.5	4.5	9.4	9.2	4.6	3.5	2.7	---	---	40.0
4) A Norm	---	---	2.0	3.6	4.7	9.5	9.4	4.5	3.5	2.7	---	---	39.9
5) Wet	---	---	2.4	3.7	4.7	9.7	9.5	5.0	3.8	2.3	---	---	41.2
Wtd Avg.	---	---	3.8	4.5	5.4	9.4	9.1	4.4	3.4	2.5	---	---	42.6

C. Farm Demand not met by Groundwater Pumping

source: = Step 7.A - Step 7.B

= Farm Demand - Groundwater Pumping

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.6	16.9	37.3	42.8	45.6	42.1	30.0	8.5	---	---	223.8
2) Dry	---	---	1.6	18.3	38.9	46.7	50.1	44.8	26.4	10.3	---	---	237.0
3) B Norm	---	---	2.9	15.8	38.9	46.8	52.0	48.6	32.0	11.0	---	---	248.0
4) A Norm	---	---	2.4	16.1	42.1	47.8	52.7	47.7	31.3	9.7	---	---	249.9
5) Wet	---	---	2.7	10.7	41.4	48.1	53.3	53.6	31.2	8.9	---	---	249.8
Wtd Avg.	---	---	1.9	15.8	39.6	46.2	50.3	46.7	30.1	9.6	---	---	240.2

D. Water Supplier Delivery to Meet Farm Demand

assumes district loss fraction of 0.08

source: = Step 7C / District High (1- loss fraction)

= Farm Demand not met by Groundwater Pumping/(1 - 0.08)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.7	18.3	40.5	46.5	49.6	45.8	32.6	9.2	---	---	243.2
2) Dry	---	---	1.7	19.8	42.3	50.8	54.5	48.6	28.7	11.2	---	---	257.6
3) B Norm	---	---	3.2	17.1	42.3	50.9	56.5	52.8	34.8	12.0	---	---	269.5
4) A Norm	---	---	2.6	17.5	45.8	52.0	57.3	51.8	34.1	10.5	---	---	271.6
5) Wet	---	---	2.9	11.6	45.0	52.3	57.9	58.3	33.9	9.6	---	---	271.6
Wtd Avg.	---	---	2.1	17.2	43.0	50.2	54.7	50.8	32.7	10.4	---	---	261.0

E. Achievable Agricultural Potential

source = Step 5.(B + C - H) + Step 6A - Step 7D.

= Surface Water Diversions + Import - Export + Export Adjustment - Water Supplier Delivery to Meet Farm Demand

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	12.1	37.4	28.0	21.0	17.1	16.5	12.2	3.0	---	---	147.2
2) Dry	---	---	12.1	41.2	34.3	31.0	27.5	27.3	18.4	5.3	---	---	196.9
3) B Norm	---	---	13.8	47.8	37.1	33.9	31.0	32.5	22.3	4.5	---	---	222.9
4) A Norm	---	---	15.8	50.1	36.4	35.0	32.9	32.7	23.4	6.6	---	---	233.0
5) Wet	---	---	19.1	58.6	38.9	36.1	34.6	35.6	27.5	5.8	---	---	256.2
Wtd Avg.	---	---	14.3	46.0	34.3	30.6	27.6	27.8	19.9	4.9	---	---	205.4

F. Groundwater Check after System Improvements

source = $(0.13 * 0.80 * \text{ETAW}) + (0.04 * (\text{Farm Demand w/o Groundwater} - \text{Water Supplier Delivery})) - \text{Groundwater Pumping}$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-9.1	-6.6	-5.3	-6.7	-6.0	-1.1	-1.3	-2.0	---	---	-38.3
2) Dry	---	---	-2.8	-2.6	-1.9	-6.7	-5.8	-0.9	-1.2	-2.2	---	---	-24.2
3) B Norm	---	---	-2.8	-2.7	-1.8	-6.7	-6.1	-1.0	-1.3	-2.1	---	---	-24.5
4) A Norm	---	---	-2.1	-2.7	-1.7	-6.8	-6.2	-1.1	-1.4	-2.2	---	---	-24.3
5) Wet	---	---	-2.6	-3.3	-1.9	-7.0	-6.4	-1.1	-1.7	-1.8	---	---	-25.7
Wtd Avg.	---	---	-4.3	-3.8	-2.7	-6.8	-6.1	-1.1	-1.3	-2.1	---	---	-28.2

Step 8. Quantifiable Objective

A. Quantifiable Objective

source = minimum (Step 3A., Step 7E.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.0	37.1	28.0	21.0	17.1	16.5	6.5	3.0	---	---	129.1
2) Dry	---	---	0.0	0.0	0.0	6.2	27.5	27.3	9.1	5.3	---	---	75.3
3) B Norm	---	---	0.0	0.0	0.0	0.0	31.0	32.5	15.9	4.5	---	---	83.8
4) A Norm	---	---	0.0	0.0	0.0	0.0	31.1	32.7	15.1	6.6	---	---	85.6
5) Wet	---	---	0.0	0.0	0.0	0.0	0.0	8.2	0.0	5.8	---	---	14.0
Wtd Avg.	---	---	0.0	9.7	7.3	6.7	21.7	23.4	9.3	4.9	---	---	83.2

Detail 114, Provide Flow to Improve Aquatic Conditions in the Tuolumne River

Step 1. Quantified Targets

A. Flow Target for Tuolumne River

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	9.2	8.3	9.2	29.0	9.2	3.0	3.1	3.1	3.0	7.7	8.9	9.2	102.8
2) Dry	11.0	10.0	11.0	46.6	11.0	4.5	4.6	4.6	4.5	7.0	10.7	11.0	136.6
3) B Norm	18.4	16.6	18.4	107.7	18.4	14.9	15.3	15.3	14.9	24.4	17.8	18.4	300.6
4) A Norm	18.4	16.6	18.4	107.7	18.4	14.9	15.3	15.3	14.9	24.4	17.8	18.4	300.6
5) Wet	18.4	16.6	18.4	107.7	18.4	14.9	15.3	15.3	14.9	24.4	17.8	18.4	300.6
Wtd Avg.	14.5	13.1	14.5	74.8	14.5	9.6	10.0	10.0	9.6	16.5	14.0	14.5	215.7

Step 2. Reference Condition

A. Tuolumne River Flows

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	38.5	34.2	74.7	115.6	105.5	121.3	120.4	105.5	60.1	69.5	54.0	60.2	959.3
2) Dry	52.9	54.0	110.0	167.5	198.6	171.3	134.7	124.5	85.7	81.4	74.1	80.2	1335.0
3) B Norm	67.1	96.2	117.5	198.4	262.5	286.6	158.2	129.7	102.5	62.8	55.0	73.7	1610.1
4) A Norm	126.7	142.4	176.3	206.1	315.2	295.6	169.6	134.8	108.8	84.0	77.7	131.7	1968.8
5) Wet	175.1	207.4	304.9	393.2	461.6	431.2	256.9	156.8	159.6	83.2	63.9	133.1	2826.8
Wtd Avg.	86.9	99.2	147.5	203.2	251.8	245.1	161.8	127.8	98.5	76.2	65.0	93.6	1656.5

B. Tuolumne River Diversions - Modesto Canal

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	4.8	5.4	22.4	38.1	37.5	42.0	44.1	36.8	17.9	14.9	6.6	6.3	276.8
2) Dry	3.0	4.1	19.2	46.3	55.4	52.2	47.9	42.8	27.2	18.7	5.9	4.7	327.2
3) B Norm	4.0	2.7	20.5	41.3	58.8	61.2	54.9	47.5	33.5	15.2	6.0	3.6	349.2
4) A Norm	1.1	6.0	18.6	40.8	61.4	62.5	54.2	47.3	33.6	17.9	8.1	4.7	356.3
5) Wet	1.6	0.8	8.1	35.4	55.0	64.5	63.3	49.8	40.5	16.9	13.2	9.9	359.0
Wtd Avg.	3.0	4.1	18.3	40.5	52.5	55.2	51.9	44.1	29.3	16.7	7.7	5.8	329.0

C. Tuolumne River Diversions - Riparian

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.1	0.8	1.2	1.7	2.3	2.7	2.6	1.4	0.3	0.1	0.1	13.1
2) Dry	0.0	0.0	0.3	1.1	1.6	2.0	2.2	2.1	1.2	0.3	0.1	0.1	11.0
3) B Norm	0.0	0.0	0.2	0.6	1.0	1.3	1.6	1.5	0.9	0.2	0.0	0.0	7.4
4) A Norm	0.0	0.0	0.2	0.6	1.4	1.8	1.9	1.9	1.0	0.4	0.0	0.0	9.2
5) Wet	0.0	0.0	0.3	0.5	1.5	1.9	2.2	2.4	1.5	0.5	0.0	0.0	10.7
Wtd Avg.	0.0	0.0	0.4	0.8	1.5	1.9	2.2	2.1	1.2	0.3	0.0	0.0	10.5

D. Tuolumne River Diversions - Turlock Canal

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	4.6	9.1	41.2	64.7	60.4	70.7	73.7	67.2	36.4	22.3	12.6	9.0	471.8
2) Dry	3.9	7.0	32.4	76.1	91.2	87.2	84.4	81.1	51.9	22.5	6.6	11.4	555.5
3) B Norm	9.3	3.7	33.0	63.6	89.4	97.0	90.7	79.2	61.7	24.9	11.2	5.7	569.3
4) A Norm	3.3	4.0	23.8	67.3	95.2	96.9	93.3	79.6	56.5	18.6	16.5	16.6	571.4
5) Wet	2.4	1.2	26.5	60.8	90.1	100.3	108.8	86.4	64.4	22.0	13.8	11.3	588.1
Wtd Avg.	4.5	5.4	32.0	66.8	83.6	88.7	88.4	77.7	52.4	21.9	12.2	11.0	544.5

E. Reference Condition for Tuolumne River

source: calculated = Step 2A. - Step 2B.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	29.0	19.6	10.4	11.5	5.9	6.3	-0.1	-1.0	4.4	31.9	34.7	44.8	197.7
2) Dry	46.1	42.9	58.2	44.0	50.4	29.9	0.2	-1.4	5.4	39.9	61.7	64.0	441.3
3) B Norm	53.9	89.8	63.7	92.9	113.2	127.1	10.9	1.5	6.4	22.6	37.8	64.5	684.2
4) A Norm	122.4	132.4	133.6	97.4	157.2	134.5	20.1	6.0	17.7	47.1	53.1	110.5	1031.9
5) Wet	171.1	205.4	270.0	296.4	315.0	264.4	82.5	18.3	53.2	43.8	36.8	111.9	1869.0
Wtd Avg.	79.4	89.7	96.7	95.2	114.2	99.4	19.3	3.9	15.6	37.2	45.0	76.8	772.5

Step 3. Quantified Targeted Benefit Change

A. Quantified Targeted Benefit Change

source: calculated: = Step 1A. - Step 2E.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	17.4	3.3	0.0	3.2	4.1	0.0	0.0	0.0	0.0	27.9
2) Dry	0.0	0.0	0.0	2.6	0.0	0.0	4.4	6.0	0.0	0.0	0.0	0.0	13.0
3) B Norm	0.0	0.0	0.0	14.8	0.0	0.0	4.4	13.9	8.5	1.8	0.0	0.0	43.3
4) A Norm	0.0	0.0	0.0	10.3	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	19.6
5) Wet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wtd Avg.	0.0	0.0	0.0	9.7	0.9	0.0	2.4	6.5	1.4	0.3	0.0	0.0	21.1

Step 4. Area Affected By Targeted Benefit

A. Total Diversion Sub-Region 11

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	10.9	15.1	55.5	119.2	127.9	138.2	147.6	127.4	73.4	34.5	8.7	8.2	866.4
2) Dry	12.5	10.3	47.6	137.8	170.4	165.8	162.0	140.2	81.5	44.4	8.1	5.9	986.5
3) B Norm	7.6	12.4	46.4	112.7	162.2	176.5	174.1	154.5	102.8	37.1	8.5	4.5	999.3
4) A Norm	2.7	14.2	42.6	106.8	171.5	182.0	177.9	155.2	104.0	45.0	12.4	5.9	1020.1
5) Wet	5.7	3.9	25.6	93.1	163.6	186.9	194.5	176.8	124.1	38.4	16.2	13.5	1042.2
Wtd Avg.	8.1	11.7	44.9	115.1	157.2	167.2	168.8	148.2	94.5	39.8	10.5	7.5	973.4

B. Sub-Region 11 Streamflow Diversion Ratio

source: calculated = Step 2B./Step 4A.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1) Critical	0.44	0.36	0.41	0.33	0.30	0.31	0.31	0.30	0.25	0.44	0.76	0.77
2) Dry	0.24	0.40	0.41	0.34	0.33	0.32	0.31	0.32	0.34	0.43	0.72	0.80
3) B Norm	0.52	0.22	0.44	0.37	0.37	0.35	0.32	0.31	0.33	0.41	0.71	0.78
4) A Norm	0.39	0.42	0.44	0.39	0.36	0.35	0.31	0.31	0.33	0.40	0.66	0.79
5) Wet	0.28	0.19	0.32	0.38	0.34	0.35	0.33	0.29	0.33	0.45	0.82	0.74
Wtd Avg.	0.38	0.33	0.41	0.36	0.34	0.33	0.31	0.31	0.31	0.42	0.73	0.78

C. Total Diversion Sub-Region 12

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	5.1	10.3	52.0	88.3	87.7	106.3	115.1	103.7	57.4	30.8	13.5	9.9	680.3
2) Dry	4.3	7.6	42.3	105.1	123.4	123.7	126.7	117.5	72.4	29.7	7.6	12.2	772.5
3) B Norm	9.6	4.0	40.5	82.2	115.6	129.6	130.0	114.2	83.6	30.8	11.7	6.1	758.2
4) A Norm	3.6	4.8	30.0	83.4	122.4	131.9	135.8	116.9	79.4	27.0	17.2	17.2	769.6
5) Wet	3.2	2.2	31.3	73.5	117.6	134.2	151.3	123.3	86.8	29.4	14.9	12.4	780.0
Wtd Avg.	5.0	6.3	40.1	87.3	111.7	123.6	130.1	114.2	74.1	29.5	13.0	11.8	746.7

D. Sub-Region 12 Streamflow Diversion Ratio

source: calculated = Step 2B./Step 4C.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1) Critical	0.90	0.88	0.80	0.74	0.70	0.68	0.65	0.66	0.65	0.73	0.94	0.92
2) Dry	0.90	0.92	0.77	0.73	0.74	0.71	0.67	0.70	0.72	0.76	0.88	0.94
3) B Norm	0.97	0.91	0.82	0.78	0.78	0.75	0.70	0.70	0.74	0.81	0.96	0.92
4) A Norm	0.92	0.84	0.80	0.81	0.78	0.74	0.69	0.69	0.72	0.69	0.96	0.96
5) Wet	0.75	0.54	0.85	0.83	0.77	0.75	0.72	0.71	0.75	0.76	0.93	0.91
Wtd Avg.	0.89	0.83	0.80	0.77	0.75	0.72	0.68	0.69	0.71	0.75	0.93	0.93

Step 5. Water Balance - Flow Path Elements

A. Rain Sub-Region 11 & 12 (inflow)

source: CVGSM Sub-Region 11 & 12 * Step 4.

Flow Path Not Affected

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	40.1	27.8	21.6	13.6	6.9	2.4	0.0	0.9	2.2	7.5	26.4	36.4	185.9
2) Dry	30.9	36.8	37.3	14.2	8.1	0.9	0.0	0.1	4.6	13.7	32.6	41.8	221.1
3) B Norm	56.0	46.0	34.3	23.8	8.5	0.9	0.1	0.2	0.9	9.8	54.0	58.6	293.1
4) A Norm	49.1	51.3	47.6	25.8	3.3	1.2	1.0	1.3	2.2	16.0	46.3	80.7	325.8
5) Wet	61.2	36.4	60.6	45.8	6.9	1.4	1.0	0.3	7.6	17.0	54.6	84.7	377.4
Wtd Avg.	46.1	39.0	38.7	23.2	6.6	1.4	0.4	0.6	3.3	12.5	40.9	58.4	271.1

B. Surface Water Diversions Sub-Region 11 & 12 (inflow)

source: CVGSM Sub-Region 11 & 12 * Step 4.

Flow Path Not Affected

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	4.2	4.3	40.2	95.2	111.3	121.4	118.5	100.8	55.8	28.5	30.9	24.6	735.7
2) Dry	3.7	10.0	46.0	123.4	149.7	154.9	153.1	135.3	92.0	32.0	37.0	21.4	958.5
3) B Norm	6.0	6.0	63.1	139.7	176.8	181.0	172.2	148.7	99.4	29.8	33.7	23.8	1,080.3
4) A Norm	6.2	8.8	61.3	149.6	178.0	180.5	170.0	147.9	102.4	30.6	34.7	31.9	1,101.8
5) Wet	6.5	3.6	53.3	152.2	173.4	182.4	185.0	146.6	108.3	32.4	37.5	35.1	1,116.3
Wtd Avg.	5.2	6.6	51.7	128.9	153.9	160.3	155.9	133.0	88.6	30.5	34.5	27.1	976.1

C. Import Sub-Region 11 & 12 (inflow)

source: CVGSM Sub-Region 11 & 12 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	4.1	4.1	23.9	56.8	61.8	70.0	72.2	65.4	38.0	23.1	22.2	19.8	461.5
2) Dry	4.3	5.2	26.5	69.6	76.2	83.6	85.8	84.3	55.2	24.2	23.9	23.4	562.1
3) B Norm	4.8	4.2	33.0	81.0	88.1	93.7	95.4	86.8	58.3	24.3	22.9	21.2	613.9
4) A Norm	5.0	5.0	34.6	86.4	90.1	95.0	95.1	85.0	57.3	22.7	25.1	24.7	626.0
5) Wet	3.8	2.8	33.0	87.5	87.1	96.0	100.0	84.0	58.9	25.1	25.4	22.1	625.8
Wtd Avg.	4.4	4.3	29.6	74.6	79.1	86.1	88.1	79.9	52.3	23.7	23.8	22.2	568.1

D. Groundwater Pumping Sub-Region 11 & 12 (inflow)

source: CVGSM Sub-Region 11 & 12 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	2.9	2.6	39.7	40.4	44.7	43.4	50.0	32.8	21.6	15.4	5.2	5.0	303.5
2) Dry	2.3	3.0	10.9	24.5	40.5	41.2	42.3	25.2	18.5	11.9	5.0	5.1	230.4
3) B Norm	3.4	2.3	10.4	12.4	33.1	40.3	38.4	22.2	19.2	13.4	5.0	5.0	205.0
4) A Norm	2.9	2.9	4.5	7.8	35.5	38.7	36.5	21.3	16.8	9.1	4.8	5.2	186.0
5) Wet	2.3	1.6	4.0	6.7	27.1	40.3	38.4	20.7	12.9	9.8	5.5	4.9	174.3
Wtd Avg.	2.8	2.5	15.8	20.3	37.2	40.9	41.8	25.1	18.1	12.1	5.1	5.1	226.8

E. ET Rain Sub-Region 11 & 12 (outflow, irrecoverable)

source: CVGSM Sub-Region 11 & 12 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	13.4	15.8	14.1	11.3	7.7	9.2	11.5	9.2	6.9	8.5	3.8	2.6	114.0
2) Dry	12.5	18.5	25.0	11.9	8.4	6.8	9.9	7.8	8.1	11.2	2.6	5.3	128.0
3) B Norm	16.9	16.6	22.7	18.4	9.2	7.4	10.8	7.7	6.1	10.8	5.6	8.8	141.1
4) A Norm	14.7	18.0	26.9	20.1	5.2	6.2	11.1	8.1	6.6	12.9	5.9	12.1	148.0
5) Wet	12.6	10.7	26.6	32.1	8.1	6.7	11.4	7.2	10.0	14.3	8.4	13.9	162.2
Wtd Avg.	13.9	16.2	22.5	17.8	7.6	7.4	10.9	8.1	7.5	11.3	5.0	8.0	136.2

F. Runoff from Rain Sub-Region 11 & 12 (outflow, irrecoverable)

source: CVGSM Sub-Region 11 & 12 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	8.6	6.1	3.5	1.8	0.5	0.1	0.0	0.0	0.1	0.1	1.5	4.8	27.0
2) Dry	9.7	10.4	7.6	1.9	0.7	0.0	0.0	0.0	0.1	0.3	2.7	6.1	39.5
3) B Norm	16.6	19.6	6.6	4.0	0.6	0.0	0.0	0.0	0.0	0.1	7.1	15.0	69.6
4) A Norm	19.1	19.2	12.8	4.2	0.1	0.0	0.0	0.0	0.0	0.4	5.6	22.4	83.7
5) Wet	29.5	16.2	24.1	10.3	0.4	0.0	0.0	0.0	0.4	0.4	5.2	25.7	112.0
Wtd Avg.	15.7	13.6	10.1	4.0	0.4	0.0	0.0	0.0	0.1	0.2	4.1	13.9	62.2

G. ETAW Sub-Region 11 & 12 (outflow, irrecoverable)

source: CVGSM Sub-Region 11 & 12 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	2.5	3.5	22.7	45.0	77.3	95.9	103.4	84.5	51.0	32.5	17.5	10.9	546.7
2) Dry	1.5	2.0	10.8	44.7	83.1	103.1	107.0	91.1	60.4	30.4	17.6	9.4	561.2
3) B Norm	1.1	1.3	15.8	42.2	88.1	110.0	111.7	91.2	63.0	31.9	15.3	5.5	577.1
4) A Norm	1.2	1.6	10.8	43.1	92.3	109.6	109.2	89.6	60.7	25.5	14.4	2.5	560.5
5) Wet	0.0	0.7	9.1	32.1	86.7	110.8	115.2	90.4	59.7	28.2	14.1	0.1	547.3
Wtd Avg.	1.4	2.0	14.4	42.1	85.0	105.0	108.6	88.9	58.3	29.8	16.0	6.2	557.6

H. Export Sub-Region 11 & 12 (outflow, irrecoverable)

source: CVGSM Sub-Region 11 & 12 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	3.8	3.4	29.1	68.7	80.4	86.8	87.1	74.7	41.2	21.1	27.0	21.5	544.8
2) Dry	2.7	8.2	33.9	90.2	109.0	112.7	112.8	101.3	68.3	23.2	31.5	18.6	712.4
3) B Norm	5.2	4.4	47.8	102.6	129.8	131.9	126.1	110.6	74.5	22.0	28.8	20.6	804.1
4) A Norm	4.9	7.2	46.4	110.3	130.7	131.8	124.4	109.1	76.1	22.5	29.3	26.9	819.7
5) Wet	5.3	2.7	39.9	112.3	127.5	133.6	135.6	106.9	78.9	24.0	32.4	29.6	828.7
Wtd Avg.	4.3	5.2	38.5	94.5	112.5	116.5	114.4	98.4	65.6	22.4	29.5	23.2	725.2

I. Surface Water Return Sub-Region 11 & 12 (outflow, recoverable)

source: CVGSM Sub-Region 11 & 12 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	1.9	1.8	31.3	47.5	37.6	31.8	32.9	26.9	16.3	9.6	7.2	6.9	251.8
2) Dry	1.8	2.3	18.1	45.6	43.0	36.9	37.0	31.4	21.6	9.5	7.9	7.9	263.2
3) B Norm	2.1	2.0	20.6	44.3	43.5	40.5	40.0	32.4	22.6	9.5	7.8	8.2	273.6
4) A Norm	2.0	2.1	19.6	43.8	45.4	40.5	39.2	31.8	22.2	8.3	8.4	10.8	274.2
5) Wet	1.8	1.2	19.5	48.9	39.0	41.0	41.8	31.7	22.8	9.1	8.8	10.8	276.4
Wtd Avg.	1.9	1.9	22.5	46.0	41.6	37.6	37.7	30.5	20.7	9.2	7.9	8.8	266.4

J. Percolation to groundwater Sub-Region 11 & 12 (outflow, recoverable)

source: CVGSM Sub-Region 11 & 12 * Step 4.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	15.2	8.2	21.2	29.5	20.5	16.9	13.7	9.8	6.0	4.1	12.4	21.4	178.7
2) Dry	11.3	12.8	22.8	33.2	27.1	23.2	20.4	16.5	13.5	6.2	16.9	26.1	230.1
3) B Norm	23.7	15.8	23.8	41.1	30.9	27.3	23.0	18.5	13.4	4.2	25.7	36.5	283.8
4) A Norm	20.4	19.4	28.6	43.2	29.6	27.3	23.4	18.6	14.0	7.0	24.9	49.5	305.8
5) Wet	24.3	13.0	29.1	51.3	28.8	27.7	25.3	17.4	16.1	7.1	30.1	51.9	322.3
Wtd Avg.	18.3	13.6	24.8	38.6	26.8	23.8	20.5	15.7	12.1	5.7	21.0	35.7	256.4

K. Evaporation Flows Sub-Region 11 & 12 (outflow, irrecoverable)

source: = 0.02 * (Step 5B + 5C - 5H)

= 0.02 * (Surface Water Diversion + Import - Export)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.1	0.1	0.7	1.7	1.9	2.1	2.1	1.8	1.1	0.6	0.5	0.5	13.0
2) Dry	0.1	0.1	0.8	2.1	2.3	2.5	2.5	2.4	1.6	0.7	0.6	0.5	16.2
3) B Norm	0.1	0.1	1.0	2.4	2.7	2.9	2.8	2.5	1.7	0.6	0.6	0.5	17.8
4) A Norm	0.1	0.1	1.0	2.5	2.7	2.9	2.8	2.5	1.7	0.6	0.6	0.6	18.2
5) Wet	0.1	0.1	0.9	2.5	2.7	2.9	3.0	2.5	1.8	0.7	0.6	0.6	18.3
Wtd Avg.	0.1	0.1	0.9	2.2	2.4	2.6	2.6	2.3	1.5	0.6	0.6	0.5	16.4

L. Sub-Region Water Balance 11 & 12

source: = Step 5.(A + B + C + D) - Step5. (E + F + G + H + I + J + K)
= (Rain + Surface Water Diversions + Import + Groundwater Pumping) - (ET Rain +
Runoff from Rain + ETAW + Export + Surface & Groundwater Return + Evaporation)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	11.7	-0.5	5.4	0.8	-2.2	-11.2	-19.9	-14.1	-9.6	-3.8	29.6	34.6	20.8
2) Dry	3.3	1.1	3.3	4.2	1.8	-9.4	-16.9	-11.2	-6.8	0.7	37.4	35.9	43.1
3) B Norm	9.1	-2.5	5.1	4.1	3.3	-8.1	-16.4	-10.0	-7.0	-3.8	49.6	27.2	50.4
4) A Norm	1.7	0.8	4.1	4.7	1.8	-6.1	-15.1	-8.3	-5.5	2.2	43.6	35.3	59.1
5) Wet	0.6	-0.6	3.3	5.1	2.6	-5.2	-15.7	-9.0	-3.7	1.0	46.7	28.4	53.5
Wtd Avg.	5.6	-0.2	4.3	3.5	1.1	-8.3	-17.0	-10.8	-6.8	-0.9	40.1	32.9	43.6

M. Applied Water Ratio Sub-Region 11 & 12

source: = Step 5G / Step 5 (B + C+ D - H)
= ETAW/(Surfce Water Diversions + Import + Groundwater Pumping - Export)

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.33	0.47	0.30	0.36	0.56	0.65	0.67	0.68	0.69	0.71	0.56	0.39	0.57
2) Dry	0.19	0.20	0.22	0.35	0.53	0.62	0.64	0.64	0.62	0.68	0.51	0.30	0.54
3) B Norm	0.12	0.16	0.27	0.32	0.52	0.60	0.62	0.62	0.61	0.70	0.47	0.19	0.53
4) A Norm	0.13	0.16	0.20	0.32	0.53	0.60	0.62	0.62	0.61	0.64	0.41	0.07	0.51
5) Wet	0.00	0.14	0.18	0.24	0.54	0.60	0.61	0.63	0.59	0.65	0.39	0.00	0.50
Wtd Avg.	0.2	0.2	0.2	0.3	0.5	0.6	0.6	0.6	0.6	0.7	0.5	0.2	0.5

N. Groundwater Check Sub-Region 11 & 12

source: = Step 5 (J - D)
= Groundwater Return Flows - Groundwater Pumping

	Thousand Acre Feet												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	12.3	5.6	-18.4	-10.9	-24.2	-26.5	-36.3	-23.0	-15.6	-11.3	7.2	16.4	-124.8
2) Dry	9.0	9.9	11.9	8.7	-13.4	-18.0	-21.9	-8.6	-5.0	-5.7	11.9	20.9	-0.4
3) B Norm	20.3	13.5	13.5	28.6	-2.2	-13.0	-15.5	-3.7	-5.8	-9.2	20.7	31.4	78.8
4) A Norm	17.5	16.5	24.0	35.4	-5.9	-11.4	-13.2	-2.7	-2.7	-2.0	20.0	44.3	119.9
5) Wet	22.0	11.4	25.1	44.6	1.8	-12.6	-13.1	-3.3	3.1	-2.7	24.6	47.0	148.0
Wtd Avg.	15.6	11.0	9.0	18.3	-10.4	-17.1	-21.3	-9.5	-6.1	-6.4	15.9	30.6	29.6

Step 6. Idealized Agricultural Potential

A. Export Adjustment

0% of Export (Step 5H.) water is available for flow/timing changes in Sub-Region 11

0% of Export (Step 5H.) water is available for flow/timing changes in Sub-Region 12

note: Import (Step 5C) and Export (Step 5H) are in the water balance. In this Step (7D) Export water is considered water that flows through districts in Sub-Regions 4, 5, and 7. This water is available to make flow/timing changes

	source: CVGSM Sub-Region 11 & 12												Thousand Acre Feet		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total		
1) Critical	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0		
2) Dry	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0		
3) B Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0		
4) A Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0		
5) Wet	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0		
Wtd Avg.	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0		

B. Idealized Agricultural Potential

source: = Step 5 ((B + C + D) + Step 6A. - Step 5 (G + H))

= Surface Water Diversions + Import + Groundwater Diversions) - (ETAW + Export
+ Export Adjustment)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Thousand Acre Feet		
1) Critical	---	---	52.0	78.6	60.1	52.0	50.2	39.8	23.2	13.4	---	---	369.4			
2) Dry	---	---	38.7	82.6	74.2	63.9	61.3	52.4	36.9	14.5	---	---	424.4			
3) B Norm	---	---	43.0	88.3	80.1	73.0	68.3	55.9	39.4	13.7	---	---	461.7			
4) A Norm	---	---	43.3	90.4	80.6	72.7	67.9	55.5	39.6	14.4	---	---	464.4			
5) Wet	---	---	41.2	101.9	73.3	74.4	72.7	54.0	41.6	15.1	---	---	474.1			
Wtd Avg.	---	---	44.2	87.2	72.7	65.8	62.8	50.6	35.1	14.1	---	---	432.6			

Step 7. Achievable Agricultural Potential

A. Farm Demand

assumes farm loss fraction of 0.13 for Sub-Region 11, and 0.13 for Sub-Region 12, values vary by SubRegion

source: = ETAW / Farm High (1- loss fraction)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Thousand Acre Feet		
1) Critical	---	---	26.1	51.8	88.8	110.3	118.9	97.1	58.6	37.3	---	---	588.9			
2) Dry	---	---	12.4	51.4	95.5	118.6	123.0	104.7	69.4	35.0	---	---	610.1			
3) B Norm	---	---	18.1	48.5	101.3	126.5	128.4	104.8	72.4	36.6	---	---	636.6			
4) A Norm	---	---	12.4	49.6	106.1	126.0	125.5	102.9	69.8	29.3	---	---	621.7			
5) Wet	---	---	10.4	37.0	99.7	127.4	132.5	103.9	68.6	32.4	---	---	611.8			
Wtd Avg.	---	---	16.6	48.3	97.6	120.7	124.9	102.2	67.0	34.2	---	---	611.6			

B. Groundwater Pumping after System Improvements

Existing Farm Efficiency for Sub-Region 11 = 0.7

Existing Farm Efficiency for Sub-Region 12 = 0.7

source: $= (1 - 0.7 * (1/0.7 - 1/(1 - \text{Farm Loss Fraction}))) * \text{Groundwater Pumping}$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	31.9	32.5	36.0	34.9	40.2	26.4	17.4	12.4	---	---	231.7
2) Dry	---	---	8.8	19.7	32.6	33.2	34.0	20.2	14.9	9.6	---	---	173.1
3) B Norm	---	---	8.3	10.0	26.6	32.4	30.9	17.8	15.5	10.8	---	---	152.3
4) A Norm	---	---	3.7	6.3	28.5	31.1	29.4	17.1	13.5	7.3	---	---	136.8
5) Wet	---	---	3.2	5.4	21.8	32.5	30.9	16.7	10.4	7.9	---	---	128.8
Wtd Avg.	---	---	12.7	16.3	29.9	32.9	33.6	20.2	14.6	9.7	---	---	170.1

C. Farm Demand not met by Groundwater Pumping

source: = Step 7.A - Step 7.B

= Farm Demand - Groundwater Pumping

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Thousands Acre Feet
1) Critical	---	---	-5.8	19.3	52.8	75.4	78.7	70.7	41.2	25.0	---	---	357.2
2) Dry	---	---	3.6	31.6	62.9	85.4	89.0	84.5	54.5	25.4	---	---	437.0
3) B Norm	---	---	9.8	38.5	74.7	94.1	97.5	87.0	56.9	25.9	---	---	484.3
4) A Norm	---	---	8.7	43.3	77.5	94.9	96.2	85.8	56.3	22.0	---	---	484.8
5) Wet	---	---	7.2	31.5	77.9	94.9	101.5	87.2	58.2	24.5	---	---	483.0
Wtd Avg.	---	---	3.8	32.0	67.7	87.8	91.2	82.0	52.4	24.5	---	---	441.5

D. Water Supplier Delivery to Meet Farm Demand

assumes district loss fraction of 0.08

source: = Step 7C / District High (1 - loss fraction)

= Farm Demand not met by Groundwater Pumping/(1 - 0.08)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Thousands Acre Feet
1) Critical	---	---	-6.3	21.0	57.4	81.9	85.5	76.8	44.8	27.1	---	---	388.3
2) Dry	---	---	4.0	34.4	68.4	92.8	96.8	91.9	59.2	27.6	---	---	475.0
3) B Norm	---	---	10.6	41.9	81.2	102.3	106.0	94.5	61.9	28.1	---	---	526.4
4) A Norm	---	---	9.5	47.1	84.3	103.2	104.5	93.3	61.2	23.9	---	---	527.0
5) Wet	---	---	7.9	34.3	84.7	103.2	110.4	94.8	63.3	26.6	---	---	525.0
Wtd Avg.	---	---	4.2	34.8	73.6	95.4	99.1	89.1	57.0	26.6	---	---	479.9

E. Achievable Agricultural Potential

source = Step 5.(B + C - H) + Step 6A - Step 7D.

= Surface Water Diversions + Import - Export + Export Adjustment - Water Supplier Delivery to Meet Farm Demand

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Thousands Acre Feet
1) Critical	---	---	41.3	62.3	35.2	22.7	18.1	14.6	7.8	3.4	---	---	205.5
2) Dry	---	---	34.6	68.4	48.4	33.0	29.3	26.5	19.5	5.4	---	---	265.1
3) B Norm	---	---	37.7	76.2	54.0	40.5	35.6	30.4	21.3	4.0	---	---	299.8
4) A Norm	---	---	40.0	78.6	53.2	40.5	36.1	30.5	22.4	6.8	---	---	308.2
5) Wet	---	---	38.4	93.1	48.3	41.7	39.1	28.9	25.1	6.8	---	---	321.3
Wtd Avg.	---	---	38.7	74.2	46.9	34.5	30.4	25.3	18.3	5.2	---	---	273.4

F. Groundwater Check after System Improvements

source = $(0.13 * 0.80 * \text{ETAW}) + (0.13 * 0.80 * \text{ETAW}) + (0.04 * (\text{Farm Demand w/o Groundwater} - \text{Water Supplier Delivery})) - \text{Groundwater Pumping}$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-37.0	-35.0	-35.2	-32.9	-39.1	-24.0	-16.0	-12.7	---	---	-231.9
2) Dry	---	---	-9.9	-18.9	-31.3	-30.4	-30.3	-15.8	-13.0	-9.3	---	---	-158.9
3) B Norm	---	---	-8.5	-8.2	-23.2	-28.7	-25.8	-12.1	-13.2	-10.7	---	---	-130.4
4) A Norm	---	---	-3.4	-3.2	-25.4	-26.5	-23.9	-11.4	-10.9	-6.8	---	---	-111.4
5) Wet	---	---	-3.2	-4.8	-17.8	-28.0	-26.2	-10.6	-7.1	-7.5	---	---	-105.2
Wtd Avg.	---	---	-14.2	-15.7	-27.6	-29.5	-29.8	-15.6	-12.4	-9.6	---	---	-154.5

Step 8. Quantifiable Objective

A. Quantifiable Objective

source = minimum (Step 3A. , Step 7E.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.0	17.4	3.3	0.0	3.2	4.1	0.0	0.0	---	---	27.9
2) Dry	---	---	0.0	2.6	0.0	0.0	4.4	6.0	0.0	0.0	---	---	13.0
3) B Norm	---	---	0.0	14.8	0.0	0.0	4.4	13.9	8.5	1.8	---	---	43.3
4) A Norm	---	---	0.0	10.3	0.0	0.0	0.0	9.3	0.0	0.0	---	---	19.6
5) Wet	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
Wtd Avg.	---	---	0.0	9.7	0.9	0.0	2.4	6.5	1.4	0.3	---	---	21.1

Detail 127, Decrease Nonproductive ET, SubRegion 11

Step 1. Quantified Targets

A. Acreage Assumed for Reduction of Nonproductive ET

source: CVGSM Sub-Region 11

Crop	Potential for ET Red.	Existing	Assumed for ET Reduction*	
			acres	percent
Pasture	No	56,500	0	0%
Alfalfa	No	9,700	0	0%
Sugar Beet	No	500	0	0%
Field	No	20,900	0	0%
Rice	No	4,700	0	0%
Truck	Yes	6,200	1,860	30%
Tomato	Yes	800	240	30%
Orchard	Yes	81,100	24,330	30%
Grains	No	2,000	0	0%
Vineyard	Yes	11,000	3,300	30%
Cotton	No	0	0	0%
Citrus and Olives	Yes	0	0	0%
Total		193,400	29,730	15%

*The Assumed
Acreage for ET
Reduction is 30% of
the crops that have the
Potential for ET
Reduction.

B. Existing ET for Sub-Region 11

source: CVGSM

Crop	Inches												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Pasture	---	---	---	---	---	---	---	---	---	---	---	---	---
Alfalfa	---	---	---	---	---	---	---	---	---	---	---	---	---
Sugar Beet	---	---	---	---	---	---	---	---	---	---	---	---	---
Field	---	---	---	---	---	---	---	---	---	---	---	---	---
Rice	---	---	---	---	---	---	---	---	---	---	---	---	---
Truck	0.00	0.00	0.00	1.40	2.20	3.90	3.70	2.70	1.80	1.20	0.00	0.00	16.90
Tomato	0.00	0.00	0.00	1.10	3.40	7.10	8.40	6.20	2.40	0.00	0.00	0.00	28.60
Orchard	0.90	1.70	1.80	3.00	5.20	6.40	7.10	6.10	4.00	2.30	1.00	0.70	40.20
Grains	---	---	---	---	---	---	---	---	---	---	---	---	---
Vineyard	0.00	0.00	0.00	1.10	3.70	5.80	6.60	5.50	3.50	1.30	0.00	0.00	27.50
Cotton	---	---	---	---	---	---	---	---	---	---	---	---	---
Citrus and Olives	0.00	0.00	1.90	2.70	4.20	4.80	5.00	4.20	2.80	2.00	0.00	0.00	27.60
Total	0.74	1.39	1.47	2.67	4.83	6.18	6.84	5.82	3.79	2.10	0.82	0.57	37.24

C. ET from Rain for Sub-Region 11

source: CVGSM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.67	0.81	0.74	0.62	0.54	0.41	0.44	0.17	0.06	0.46	0.47	0.34	5.74
2) Dry	0.65	0.82	1.31	0.65	0.51	0.21	0.20	0.01	0.12	0.61	0.44	0.49	6.03
3) B Norm	0.68	0.85	1.15	1.02	0.45	0.20	0.20	0.01	0.00	0.55	0.56	0.44	6.11
4) A Norm	0.67	0.85	1.35	1.02	0.23	0.17	0.25	0.07	0.04	0.72	0.70	0.47	6.52
5) Wet	0.70	0.86	1.37	1.66	0.37	0.22	0.26	0.02	0.30	0.73	0.75	0.50	7.75
Wtd Avg.	0.67	0.84	1.16	0.94	0.42	0.25	0.28	0.07	0.10	0.60	0.57	0.44	6.35

D. Existing ETAW for Sub-Region 11

	source: calculated = Step 1B.(Average Total) - Step 1C., (set to 0 if Step 1B. - Step 1C. <0)											Inches	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.07	0.58	0.73	2.05	4.29	5.78	6.40	5.65	3.73	1.64	0.35	0.23	31.50
2) Dry	0.09	0.57	0.16	2.02	4.32	5.97	6.64	5.81	3.67	1.49	0.38	0.08	31.21
3) B Norm	0.05	0.54	0.33	1.66	4.38	5.98	6.64	5.81	3.79	1.56	0.25	0.14	31.13
4) A Norm	0.07	0.54	0.13	1.65	4.60	6.02	6.60	5.75	3.75	1.38	0.12	0.11	30.72
5) Wet	0.04	0.53	0.10	1.01	4.46	5.96	6.58	5.80	3.49	1.37	0.06	0.07	29.48
Wtd Avg.	0.07	0.55	0.32	1.73	4.41	5.93	6.56	5.75	3.70	1.50	0.24	0.13	30.89

E. Target ETAW for Sub-Region 11

	source: calculated = Step 1D. * 90%											Inches	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.06	0.52	0.66	1.85	3.86	5.20	5.76	5.08	3.36	1.48	0.32	0.21	28.35
2) Dry	0.08	0.51	0.14	1.82	3.89	5.37	5.98	5.23	3.31	1.35	0.34	0.07	28.09
3) B Norm	0.05	0.48	0.29	1.49	3.94	5.38	5.98	5.23	3.41	1.40	0.23	0.12	28.02
4) A Norm	0.06	0.49	0.11	1.49	4.14	5.41	5.94	5.17	3.38	1.24	0.11	0.10	27.65
5) Wet	0.03	0.47	0.09	0.91	4.01	5.37	5.92	5.22	3.14	1.24	0.06	0.07	26.54
Wtd Avg.	0.06	0.50	0.29	1.56	3.97	5.34	5.90	5.18	3.33	1.35	0.22	0.12	27.80

Step 2. Reference Condition

For ET Reduction the Reference Condition is the existing Crop ET, Step 1B.

Step 3. Quantified Targeted Benefit Change

A. Quantified Targeted Benefit Change for Sub-Region 11

	source: calculated = Step 1D - Step 1E											Inches	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	0.06	0.07	0.21	0.43	0.58	0.64	0.56	0.37	0.16	---	---	3.09
2) Dry	---	0.06	---	0.20	0.43	0.60	0.66	0.58	0.37	0.15	---	---	3.05
3) B Norm	---	0.05	---	0.17	0.44	0.60	0.66	0.58	0.38	0.16	---	---	3.04
4) A Norm	---	0.05	---	0.17	0.46	0.60	0.66	0.57	0.38	0.14	---	---	3.03
5) Wet	---	0.05	---	0.10	0.45	0.60	0.66	0.58	0.35	0.14	---	---	2.92
Wtd Avg.	---	0.06	---	0.17	0.44	0.59	0.66	0.58	0.37	0.15	---	---	3.03

B. Quantified Targeted Benefit Change for Sub-Region 11

	source: calculated = Step 1D - Step 1E											Thousand Acre Feet	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	0.14	0.18	0.51	1.06	1.43	1.59	1.40	0.92	0.41	---	---	7.6
2) Dry	---	0.14	---	0.50	1.07	1.48	1.65	1.44	0.91	0.37	---	---	7.6
3) B Norm	---	0.13	---	0.41	1.08	1.48	1.65	1.44	0.94	0.39	---	---	7.5
4) A Norm	---	0.13	---	0.41	1.14	1.49	1.63	1.42	0.93	0.34	---	---	7.5
5) Wet	---	0.13	---	0.25	1.10	1.48	1.63	1.44	0.87	0.34	---	---	7.2
Wtd Avg.	---	0.14	---	0.43	1.09	1.47	1.62	1.43	0.92	0.37	---	---	7.5

Step 4. Area Affected by Targeted Benefit

Area affected are the 29,730 acres identified in Step 1A.

Step 5. Water Flow Path Elements

The flow path elements used in this analysis are given in Step 1.

Step 6. Idealized Agricultural Potential

Additional ET research is required to determine this component.

Step 7. Achievable Agricultural Potential

The farm Available Agricultural Potential is the same as Step 3B.

Step 8. Quantifiable Objective

- A. For ET Reduction the Quantifiable Objective is Step 3B

Detail 129, Provide long-term diversion flexibility to increase the water supply for beneficial uses.

Step 1. Quantified Targets

A. Percentage of Subregion 11 in each Wetland Region

source: GIS analysis

Basin	Basin Acres	Sub-Region 11 Acres	Ratio Acreage in Sub-Region to Total Acreage
Colusa	1,100,765	1	--
Butte	574,618	1	--
Sutter	224,142	1	--
American	517,893	1	--
Yolo	514,963	1	--
Delta	1,332,584	127,226	0.10
Suisun	99,311	1	--
San Joaquin	1,877,034	157,713	0.08
Tulare	3,523,884	1	--

B. Annual Water Need for Optimum Habitat by Wetland Type

source: Central Valley Wetlands Water Supply Investigations (August, 2000)

Basin	Seasonal Wetlands	Semi-Permanent Wetlands	Permanent Wetlands	Annual Total
-----Acre Feet-----				
Colusa	43,435	7,563	6,771	57,769
Butte	72,923	11,337	10,150	94,410
Sutter	469	81	73	622
American	5,695	992	888	7,575
Yolo	25,755	4,484	4,015	34,254
Delta	10,053	1,843	1,650	13,546
Suisun	119,995	21,993	19,690	161,677
San Joaq.	188,480	20,663	15,856	225,000
Tulare	15,640	1,854	1,415	18,908

C. Fraction of Water Need Requirements by Month as a Percentage of Total Water Need- Seasonal Wetlands

source: Central Valley Wetlands Water Supply Investigations (August, 2000)

Basin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Colusa	0.04	0.04	0.04	0.00	0.14	0.00	0.00	0.18	0.36	0.08	0.08	0.04	1.0
Butte	0.04	0.04	0.04	0.00	0.18	0.00	0.00	0.16	0.36	0.09	0.07	0.04	1.0
Sutter	0.04	0.04	0.04	0.00	0.14	0.00	0.00	0.18	0.36	0.08	0.08	0.04	1.0
American	0.04	0.04	0.04	0.00	0.14	0.00	0.00	0.18	0.36	0.08	0.08	0.04	1.0
Yolo	0.04	0.04	0.04	0.00	0.14	0.00	0.00	0.18	0.36	0.08	0.08	0.04	1.0
Delta	0.04	0.04	0.04	0.05	0.00	0.00	0.00	0.19	0.42	0.08	0.08	0.04	1.0
Suisun	0.04	0.04	0.04	0.05	0.00	0.00	0.00	0.19	0.42	0.08	0.08	0.04	1.0
San Joaq.	0.04	0.04	0.00	0.00	0.15	0.05	0.00	0.15	0.38	0.08	0.08	0.04	1.0
Tulare	0.04	0.04	0.00	0.15	0.00	0.11	0.00	0.09	0.38	0.08	0.08	0.04	1.0

D. Fraction of Water Need Requirements by Month as a Percentage of Total Water Need- Semi-Permanent Wetlands
source: Central Valley Wetlands Water Supply Investigations (August, 2000)

Basin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Colusa	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Butte	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Sutter	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
American	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Yolo	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Delta	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Suisun	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
San Joaq.	0.03	0.03	0.05	0.07	0.07	0.14	0.14	0.00	0.00	0.41	0.05	0.03	1.0
Tulare	0.03	0.04	0.06	0.08	0.08	0.13	0.13	0.00	0.00	0.38	0.06	0.04	1.0

E. Fraction of Water Need Requirements by Month as a Percentage of Total Water Need- Permanent Wetlands

source: Central Valley Wetlands Water Supply Investigations (August, 2000)

Basin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Colusa	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Butte	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Sutter	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
American	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Yolo	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Delta	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Suisun	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
San Joaq.	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0
Tulare	0.02	0.02	0.04	0.08	0.11	0.15	0.15	0.15	0.13	0.08	0.06	0.02	1.0

F. Target Water Application for Private Wetlands in Sub-Region 11

source: calculated using Step1A through Step 1E

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Seasonal	0.6	0.6	0.0	0.1	2.4	0.8	-	2.6	6.4	1.3	1.3	0.6	16.8
Semi-Perman	0.1	0.1	0.1	0.1	0.1	0.3	0.3	-	-	0.8	0.1	0.1	1.9
Permanent	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	1.5
Total	0.7	0.7	0.2	0.3	2.7	1.2	0.5	2.8	6.6	2.2	1.5	0.7	20.2

Step 2. Reference Condition

A. Annual Available Water Supply by Wetland Type

source: Central Valley Wetlands Water Supply Investigations

Basin	Wetlands		Wetlands Acre Feet	Permanent Wetlands	Total
	Wetlands	Wetlands			
Colusa	36,601		6,625	6,101	49,327
Butte	57,797		9,261	8,667	75,725
Sutter	355		66	62	483
American	4,328		804	754	5,886
Yolo	25,755		4,484	4,015	34,254
Delta	10,053		1,843	1,650	13,546
Suisun	119,995		21,993	19,690	161,678
San Joaquin	181,676		19,922	15,403	217,001
Tulare	15,181		1,802	1,373	18,356

B. Available Water for Private Wetlands in Sub-Region 11

source: calculated based on Step 2A and steps 1A, 1C, 1D, and 1E

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Seasonal	0.6	0.6	0.0	0.1	2.3	0.7	-	2.5	6.2	1.2	1.2	0.6	16.2
Semi-Perm.	0.0	0.0	0.1	0.1	0.1	0.2	0.2	-	-	0.7	0.1	0.0	1.8
Permanent	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	1.5
Total	0.7	0.7	0.2	0.3	2.6	1.2	0.5	2.7	6.4	2.1	1.4	0.7	19.5

Step 3. Quantified Targeted Benefit Change

A. Additional Water Required for Optimum Management of Private Wetlands in Sub-Region

source: calculated: Step 1F- Step 2B

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Seasonal	0.0	0.0	-	-	0.1	0.0	-	0.1	0.2	0.0	0.0	0.0	0.6
Semi-Perm.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.1
Permanent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.7

Step 4. Area Affected By Targeted Benefit

This analysis assumes that all of the agricultural lands in the sub-region could potentially contribute to the provision of additional waters for wetlands.

Step 5. Water Flow Path Elements

A. Rain Sub-Region (inflow)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	28.1	20.4	16.4	11.7	6.5	2.2	0.0	0.9	2.5	6.4	14.5	21.2	131.0
2) Dry	25.2	25.6	29.8	11.6	7.4	0.8	0.1	0.3	4.6	11.4	18.3	22.4	157.6
3) B Norm	35.7	36.8	26.4	19.5	6.7	0.9	0.0	0.3	0.6	8.1	30.6	33.0	198.5
4) A Norm	35.9	36.6	36.1	19.8	2.7	1.1	1.0	1.4	1.9	13.6	26.6	43.6	220.4
5) Wet	54.8	45.6	46.3	35.0	5.3	1.2	1.3	0.3	7.3	13.5	29.7	49.2	289.5
Wtd Avg.	34.7	31.6	29.8	18.4	5.7	1.3	0.4	0.7	3.3	10.4	22.9	32.7	191.9

B. Surface Water Diversions Sub-Region (inflow)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	6.7	7.4	51.3	162.1	187.8	214.1	222.2	210.3	135.3	48.3	39.3	30.2	1,315.0
2) Dry	8.1	19.9	53.8	195.9	211.4	245.4	261.6	253.8	162.3	50.6	48.8	24.6	1,536.3
3) B Norm	7.8	17.0	78.3	197.9	230.1	257.6	262.8	263.4	172.3	49.8	45.4	28.1	1,610.4
4) A Norm	10.2	15.9	76.8	208.0	233.6	263.3	267.5	260.5	176.5	52.3	49.7	37.3	1,651.6
5) Wet	16.8	11.9	74.2	210.8	237.8	264.1	281.3	259.7	174.7	52.0	44.4	44.3	1,671.9
Wtd Avg.	9.5	14.0	65.3	192.4	217.3	246.1	256.0	246.4	161.9	50.5	45.3	32.5	1,537.1

C. Import Sub-Region (inflow)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	2.1	2.2	19.5	65.9	79.0	85.6	90.1	85.0	57.9	25.3	13.1	10.2	535.8
2) Dry	2.3	2.7	23.3	78.2	93.6	100.2	107.1	101.8	68.1	26.6	14.9	11.5	630.4
3) B Norm	2.1	2.5	25.7	82.4	98.0	104.4	112.1	106.2	71.2	25.9	13.9	10.8	655.2
4) A Norm	2.5	2.7	26.2	83.1	98.6	105.3	112.7	106.1	71.5	27.0	15.4	12.2	663.3
5) Wet	2.5	2.4	26.2	83.0	98.5	105.2	112.7	106.0	71.4	26.9	14.6	11.8	661.2
Wtd Avg.	2.3	2.5	23.8	77.5	92.4	99.0	105.6	99.7	67.2	26.3	14.4	11.3	621.7

D. Groundwater Pumping Sub-Region (inflow)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	3.4	3.2	24.6	17.4	17.9	24.5	24.8	12.0	9.2	9.4	4.5	4.3	155.3
2) Dry	3.6	3.7	8.3	9.8	11.4	24.2	24.2	11.8	9.2	8.0	4.6	4.3	123.1
3) B Norm	3.5	3.6	8.3	9.1	11.4	24.2	24.2	11.8	9.2	7.9	4.6	4.3	122.2
4) A Norm	3.7	3.6	5.8	9.1	11.4	24.2	24.2	11.8	9.3	7.9	4.6	4.4	120.0
5) Wet	4.0	3.5	5.8	9.1	11.4	24.2	24.2	11.8	9.3	7.4	4.5	4.4	119.7
Wtd Avg.	3.6	3.5	11.6	11.4	13.1	24.3	24.4	11.9	9.2	8.2	4.6	4.4	130.1

E. ET Rain Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	10.7	13.1	12.0	10.0	8.7	6.5	7.2	2.8	1.0	7.4	7.5	5.6	92.5
2) Dry	10.5	13.2	21.2	10.5	8.2	3.5	3.2	0.1	2.0	9.8	7.1	7.9	97.2
3) B Norm	11.0	13.8	18.5	16.4	7.3	3.2	3.2	0.1	-0.4	8.8	9.1	7.0	98.0
4) A Norm	10.7	13.6	21.7	16.4	3.7	2.7	4.0	1.2	0.6	11.6	11.3	7.5	105.1
5) Wet	11.3	13.9	22.1	26.8	6.0	3.5	4.2	0.3	4.8	11.7	12.2	8.1	125.0
Wtd Avg.	10.8	13.5	18.6	15.2	6.8	4.1	4.6	1.1	1.5	9.7	9.2	7.1	102.2

F. Runoff from Rain Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5
2) Dry	0.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.3
3) B Norm	1.2	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.6	3.5
4) A Norm	0.8	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	3.9
5) Wet	2.2	2.1	2.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.8	9.4
Wtd Avg.	0.8	0.8	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	3.3

G. ETAW Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.5	1.4	18.6	41.5	75.1	98.2	108.9	93.9	63.5	29.6	7.0	2.5	540.9
2) Dry	0.8	1.3	9.4	41.1	75.6	101.3	112.8	96.6	62.5	27.3	7.4	0.1	536.2
3) B Norm	0.3	0.7	12.2	35.2	76.5	101.5	112.8	96.6	64.9	28.3	5.4	1.0	535.4
4) A Norm	0.5	0.9	8.9	35.1	80.2	102.1	112.1	95.5	63.8	25.5	3.2	0.4	528.2
5) Wet	0.0	0.6	8.5	24.8	77.8	101.2	111.8	96.4	59.6	25.3	2.3	0.0	508.4
Wtd Avg.	0.5	1.0	12.0	36.4	77.0	100.7	111.5	95.6	63.0	27.4	5.3	0.9	531.1

H. Export Sub-Region (outflow, irrecoverable)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	7.6	8.1	39.1	116.6	134.6	152.7	158.6	150.0	95.2	35.4	35.0	27.4	960.2
2) Dry	9.0	19.0	41.1	142.4	152.0	175.8	188.5	183.4	115.6	37.4	42.9	22.6	1,129.6
3) B Norm	8.6	16.5	61.5	144.0	167.4	185.9	189.4	191.4	123.7	36.6	40.1	25.6	1,190.7
4) A Norm	10.8	15.5	60.3	152.3	170.3	190.5	193.2	188.9	127.3	38.7	43.6	33.3	1,224.7
5) Wet	16.6	12.1	58.2	154.7	173.8	191.3	204.8	188.3	125.8	38.4	39.2	39.2	1,242.4
Average	10.2	13.9	50.7	140.0	157.4	177.1	184.4	178.0	115.7	37.2	40.0	29.3	1,133.8

I. Surface Runoff Sub-Region (outflow, recoverable)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	7.0	14.8	17.3	20.1	20.8	17.8	12.5	6.1	2.4	1.6	120.4
2) Dry	0.0	0.0	5.2	15.7	18.6	22.4	23.5	20.3	14.4	6.2	2.9	1.6	130.8
3) B Norm	0.0	0.0	5.3	16.1	19.3	22.6	24.2	21.0	14.5	6.0	2.5	1.6	133.0
4) A Norm	0.0	0.0	4.8	16.1	19.3	22.6	24.2	21.0	14.5	6.3	3.0	1.6	133.4
5) Wet	0.0	0.0	4.8	16.1	19.3	22.6	24.2	21.0	14.5	5.9	2.6	1.6	132.6
Average	0.0	0.0	5.5	15.7	18.7	21.9	23.1	20.0	14.0	6.1	2.7	1.6	129.3

J. Percolation to Groundwater Sub-Region (outflow, recoverable)

source: CVGSM Sub-Region 11

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	18.8	9.8	24.5	44.9	23.6	15.1	9.2	7.9	6.9	3.8	9.8	19.3	193.6
2) Dry	16.8	13.5	27.6	50.1	32.0	26.0	21.3	20.7	18.9	7.3	14.2	22.8	271.1
3) B Norm	25.6	25.8	25.3	61.1	34.4	29.6	25.1	24.3	18.2	4.2	24.3	32.7	330.7
4) A Norm	26.4	24.1	33.5	61.7	31.3	29.9	26.4	25.5	19.8	9.2	24.9	43.7	356.4
5) Wet	43.7	32.8	42.8	75.7	33.6	30.0	26.4	24.5	24.3	8.9	26.8	49.4	418.9
Average	25.1	19.9	30.2	57.1	30.3	25.2	20.7	19.6	16.7	6.6	19.0	32.3	302.5

K. Evaporation Flows Sub-Region

source: = 0.02 * (Step 5B + 5C - 5H)

= 0.02 * (Surface Water Diversion + Import - Export)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.6	2.2	2.6	2.9	3.1	2.9	2.0	0.8	0.3	0.3	17.8
2) Dry	0.0	0.1	0.7	2.6	3.1	3.4	3.6	3.4	2.3	0.8	0.4	0.3	20.7
3) B Norm	0.0	0.1	0.8	2.7	3.2	3.5	3.7	3.6	2.4	0.8	0.4	0.3	21.5
4) A Norm	0.0	0.1	0.9	2.8	3.2	3.6	3.7	3.6	2.4	0.8	0.4	0.3	21.8
5) Wet	0.1	0.0	0.8	2.8	3.3	3.6	3.8	3.5	2.4	0.8	0.4	0.3	21.8
Wtd Avg.	0.0	0.1	0.8	2.6	3.0	3.4	3.5	3.4	2.3	0.8	0.4	0.3	20.5

L. Sub-Region Water Balance

source: = Step 5.(A + B + C + D) - Step5. (E + F + G + H + I + J + K)

= (Rain + Surface Water Diversions + Import + Groundwater Pumping) - (ET Rain +

Runoff from Rain + ETAW + Export + Surface & Groundwater Return + Evaporation)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	2.4	0.7	9.9	27.1	29.2	30.8	29.4	32.9	23.8	6.3	9.4	9.1	211.2
2) Dry	1.8	4.1	10.0	33.1	34.3	38.1	40.2	43.2	28.6	7.9	11.5	7.6	260.6
3) B Norm	2.4	2.3	14.9	33.2	38.1	40.8	40.7	44.8	30.1	6.9	11.9	7.4	273.4
4) A Norm	2.9	3.8	13.9	35.4	38.3	42.6	41.8	44.3	30.8	8.6	9.6	9.6	281.7
5) Wet	4.2	1.8	13.0	36.3	39.3	42.4	44.4	43.8	31.2	8.7	9.3	9.4	283.8
Wtd Avg.	2.7	2.5	12.1	32.6	35.3	38.3	38.5	41.1	28.5	7.6	10.3	8.7	258.0

M. Applied Water Ratio Sub-Region

source: = Step 5G / Step 5 (B + C+ D - H)

= ETAW/(Surfce Water Diversions + Import + Groundwater Pumping - Export)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.12	0.30	0.33	0.32	0.50	0.57	0.61	0.60	0.59	0.62	0.32	0.14	0.52
2) Dry	0.16	0.17	0.21	0.29	0.46	0.52	0.55	0.52	0.50	0.57	0.29	0.01	0.46
3) B Norm	0.06	0.11	0.24	0.24	0.44	0.51	0.54	0.51	0.50	0.60	0.23	0.06	0.45
4) A Norm	0.10	0.13	0.18	0.24	0.46	0.50	0.53	0.50	0.49	0.53	0.12	0.02	0.44
5) Wet	0.00	0.10	0.18	0.17	0.45	0.50	0.52	0.51	0.46	0.53	0.10	0.00	0.42
Wtd Avg.	0.1	0.2	0.2	0.3	0.5	0.5	0.6	0.5	0.5	0.6	0.2	0.1	0.5

N. Groundwater Check Sub-Region

source: = Step 5 (J - D)

= Groundwater Return Flows - Groundwater Pumping

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	15.4	6.5	-0.1	27.4	5.7	-9.4	-15.6	-4.2	-2.3	-5.6	5.2	15.0	38.2
2) Dry	13.2	9.8	19.3	40.3	20.6	1.8	-2.9	8.9	9.6	-0.8	9.6	18.5	148.0
3) B Norm	22.1	22.2	17.1	52.0	23.0	5.4	0.8	12.5	8.9	-3.6	19.8	28.4	208.5
4) A Norm	22.7	20.5	27.7	52.6	19.9	5.6	2.2	13.6	10.5	1.3	20.3	39.3	236.4
5) Wet	39.7	29.4	37.0	66.6	22.1	5.8	2.1	12.6	15.1	1.6	22.3	44.9	299.2
Wtd Avg.	21.5	16.4	18.5	45.7	17.2	0.9	-3.7	7.7	7.5	-1.7	14.4	27.9	172.3

6. Idealized Agricultural Potential

A. Export Adjustment

0% of Export (Step 5H.) water is available for flow/timing changes in Sub-Region

note: Import (Step 5C) and Export (Step 5H) are in the water balance. In this Step (7D) Export water is considered water that flows through districts in Sub-Regions 4, 5, and 7. This water is available to make flow/timing changes

	source: CVGSM Sub-Region												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
2) Dry	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
3) B Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
4) A Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
5) Wet	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
Wtd Avg.	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	N/A	0.0

B. Idealized Agricultural Potential

source: = Step 5 ((B + C + D) + Step 6A. - Step 5 (G + H))

= Surface Water Diversions + Import + Groundwater Diversions) - (ETAW + Export
+ Export Adjustment)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	37.7	87.3	75.0	73.3	69.7	63.4	43.7	17.9	---	---	468.0
2) Dry	---	---	34.9	100.4	88.8	92.7	91.6	87.4	61.5	20.6	---	---	577.9
3) B Norm	---	---	38.6	110.2	95.7	98.9	96.9	93.5	64.1	18.6	---	---	616.4
4) A Norm	---	---	39.5	112.7	93.2	100.2	99.2	94.0	66.2	23.0	---	---	628.0
5) Wet	---	---	39.5	123.5	96.1	100.9	101.6	92.8	70.0	22.5	---	---	646.9
Wtd Avg.	N/A	N/A	38.0	104.9	88.4	91.6	90.0	84.4	59.7	20.4	N/A	N/A	577.2

7. Achievable Agricultural Potential

A. Farm Demand

assumes farm loss fraction of 0.13 for Sub-Region , values vary by SubRegion

source: = ETAW / Farm High (1- loss fraction)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	21.4	47.8	86.3	112.9	125.1	108.0	73.0	34.1	---	---	608.5
2) Dry	---	---	10.9	47.2	86.9	116.4	129.7	111.0	71.9	31.4	---	---	605.4
3) B Norm	---	---	14.0	40.4	87.9	116.7	129.7	111.0	74.6	32.5	---	---	606.8
4) A Norm	---	---	10.3	40.4	92.1	117.3	128.8	109.8	73.4	29.3	---	---	601.3
5) Wet	---	---	9.8	28.5	89.4	116.4	128.5	110.8	68.5	29.1	---	---	581.0
Wtd Avg.	---	---	13.8	41.8	88.5	115.7	128.1	109.9	72.4	31.4	---	---	601.7

B. Groundwater Pumping after System Improvements

Existing Farm Efficiency for Sub-Region = 0.70

source: $= (1 - 0.7 * (1/0.7 - 1/(1 - \text{Farm Loss Fraction}))) * \text{Groundwater Pumping}$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	19.8	14.0	14.4	19.7	20.0	9.7	7.4	7.5	---	---	112.5
2) Dry	---	---	6.7	7.9	9.2	19.5	19.5	9.5	7.4	6.5	---	---	86.1
3) B Norm	---	---	6.7	7.3	9.2	19.5	19.5	9.5	7.4	6.3	---	---	85.4
4) A Norm	---	---	4.6	7.3	9.2	19.5	19.5	9.5	7.4	6.4	---	---	83.4
5) Wet	---	---	4.6	7.3	9.2	19.5	19.5	9.5	7.4	5.9	---	---	83.0
Wtd Avg.	---	---	9.3	9.2	10.5	19.5	19.6	9.6	7.4	6.6	---	---	91.8

C. Farm Demand not met by Groundwater Pumping

source: $= \text{Step 7.A} - \text{Step 7.B}$

$= \text{Farm Demand} - \text{Groundwater Pumping}$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Thousands Acre Feet
1) Critical	---	---	1.6	33.7	72.0	93.2	105.2	98.3	65.6	26.5	---	---	496.0
2) Dry	---	---	4.1	39.4	77.8	97.0	110.2	101.5	64.4	24.9	---	---	519.3
3) B Norm	---	---	7.3	33.1	78.7	97.2	110.2	101.5	67.2	26.2	---	---	521.4
4) A Norm	---	---	5.6	33.1	83.0	97.8	109.3	100.3	65.9	22.9	---	---	517.9
5) Wet	---	---	5.1	21.1	80.2	96.9	109.0	101.3	61.1	23.2	---	---	498.0
Wtd Avg.	---	---	4.5	32.6	77.9	96.2	108.5	100.4	65.0	24.8	---	---	509.9

D. Water Supplier Delivery to Meet Farm Demand

assumes district loss fraction of 0.08

source: $= \text{Step 7C} / \text{District High (1 - loss fraction)}$

$= \text{Farm Demand not met by Groundwater Pumping} / (1 - 0.08)$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Thousands Acre Feet
1) Critical	---	---	1.7	36.7	78.2	101.3	114.3	106.8	71.3	28.8	---	---	539.2
2) Dry	---	---	4.5	42.8	84.5	105.4	119.8	110.3	70.0	27.1	---	---	564.5
3) B Norm	---	---	8.0	36.0	85.6	105.7	119.8	110.3	73.0	28.5	---	---	566.7
4) A Norm	---	---	6.1	35.9	90.2	106.3	118.8	109.0	71.6	24.9	---	---	562.9
5) Wet	---	---	5.6	23.0	87.2	105.3	118.5	110.1	66.4	25.2	---	---	541.3
Wtd Avg.	---	---	4.8	35.5	84.7	104.6	117.9	109.1	70.6	27.0	---	---	554.2

E. Achievable Agricultural Potential

source = Step 5.(B + C - H) + Step 6A - Step 7D.

$= \text{Surface Water Diversions} + \text{Import} - \text{Export} + \text{Export Adjustment} - \text{Water Supplier Delivery to Meet Farm Demand}$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Thousands Acre Feet
1) Critical	---	---	30.0	74.7	54.0	45.7	39.4	38.5	26.7	9.4	---	---	318.4
2) Dry	---	---	31.5	88.9	68.5	64.4	60.5	61.8	44.8	12.8	---	---	433.2
3) B Norm	---	---	34.5	100.3	75.2	70.5	65.7	67.9	46.8	10.6	---	---	471.4
4) A Norm	---	---	36.6	102.8	71.7	71.7	68.2	68.7	49.2	15.6	---	---	484.5
5) Wet	---	---	36.6	116.2	75.3	72.7	70.7	67.2	53.9	15.3	---	---	507.9
Wtd Avg.	---	---	33.5	94.4	67.6	63.4	59.1	59.1	42.8	12.6	---	---	432.4

F. Groundwater Check after System Improvements

source = $(0.13 * 0.80 * \text{ETAW}) + (0.04 * (\text{Farm Demand w/o Groundwater} - \text{Water Supplier Delivery})) - \text{Groundwater Pumping}$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-22.7	-13.2	-10.3	-14.6	-13.9	-2.6	-2.8	-6.4	---	---	-86.5
2) Dry	---	---	-7.4	-5.6	-3.8	-14.0	-12.8	-2.1	-3.0	-5.3	---	---	-54.0
3) B Norm	---	---	-7.0	-5.6	-3.7	-14.0	-12.9	-2.1	-2.7	-5.0	---	---	-53.0
4) A Norm	---	---	-4.9	-5.6	-3.4	-14.0	-12.9	-2.2	-2.8	-5.3	---	---	-51.1
5) Wet	---	---	-4.9	-6.6	-3.6	-14.0	-13.0	-2.1	-3.3	-4.8	---	---	-52.4
Wtd Avg.	---	---	-10.4	-7.7	-5.4	-14.2	-13.2	-2.3	-2.9	-5.5	---	---	-61.4

8. Quantifiable Objective

source = min(Step 3A Wtd Avg, Step 7E)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Wtd Avg	---	---	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.1	---	---	0.6